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THE

CLASS MAMMALIA

ARRANGED BY THE

BARON CUVIER,

WITH

34242

SPECIFIC DESCRIPTIONS

BY

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LIST OF PLATES IN THE FOURTH VOLUME.

	To face Page
Bush Antelope	258
Four-tufted Antelope	261
Cambing Ootan	277
Chamois	281
Woolbearing Antelope	286
Abyssinian Ibex	301
Ibex	302
Jemlah Goat	308
American Argali	318
Zunu or Goitered Sheep	327
Caama	348
Sassayby	352
Heads and Horns of Damalis Senegalensis, Dicranorerus, *&c.*	352
Impoofo	355
External and internal Views of Horns of Catoplebas, *&c.*	366
Brindled Gnoo	371
Cape Buffalo	384
Pegasse of Angola	386
Pulo Condor Buffalo	392
Bison	401
Gayal	406
Wild Ox	411
Fronted Dolphin	457

Errata in the Plates.

IN PLATE OF HORNS, &C. OF ANTELOPES.

Damalis Cunna . . . . . *read* Damalis Canna

IN PLATE OF HORNS, &C. OF GOATS AND ANTELOPES.

Mytilopes . . . . . *read* Gaz. Subgutturosa
Gaz. Subgutturosa . . . . . „ Gaz. Mytilopes.

THE

SEVENTH ORDER

OF THE

MAMMALIA.

THE RUMINANTIA,

(PECORA. LIN.)

Is perhaps the most natural and best determined of the class, for these animals have the appearance of being almost altogether constructed on the same model, and the camels alone present some small exceptions to the common character.

The first of these characters is the absence of incisive teeth in the upper jaw; in the lower there are almost always eight. In the upper jaw, instead of teeth, there is a callous pad. Between the incisors and the molars is a void space, in which only in a few genera are one or two canines. The cheek-teeth, almost always six on each side in each jaw, have the coronals marked with two double crosses, of which the convexity is turned inward in the upper teeth, and outward in the lower.

The fore-feet are terminated by two toes, and by two hoofs, which face each other by a flat side, so that they have the appearance of a single hoof which had been cleft, whence these animals are said to be bifurcated.

Behind the hoof there are sometimes two small spurs, the only vestiges of lateral toes. The two bands of the metacarpus and metatarsus are united nto one.

The name Ruminantia indicates the singular property of these animals, of masticating their aliment a second time which they bring back into the mouth after a first deglutition. This property results from the structure of their stomachs; of these they always have four, the three first of which are so disposed that the food can enter indifferently into either of them, because the œsophagus abuts on the point of communication.

The first and largest is called the *paunch* (*ventriculus*); it receives in abundance the vegetable food, grossly pounded by the first mastication. From this it goes into the second, called the *honeycomb*, or *bonnet* (*reticulum*), the sides of which have laminæ similar to the honeycomb. This stomach is very small and globular; it seizes the food, imbibes and compresses it into little pellets, which afterwards remount successively to the mouth, to be again masticated. The animal remains quiet during this operation, which continues until all the food swallowed before into the paunch has submitted to it. The food, in this manner chewed a second time, descends directly into the third stomach (*omasum*), named *feuillet*, because its sides have longitudinal laminæ like the leaves of a book, and from thence into the fourth (*abomassum*), or *caillette*, the sides of which are in wrinkles, and this is the true organ of diges-

tion, analogous to the simple stomach of common animals. So long as the ruminants live only on their mother's milk, this last is the largest of the stomachs. The paunch does not develop itself, and takes its enormous size only by the reception of the food. The intestinal canal of the ruminants is very long, though but little swelled in the large intestines. Their cæcum is the same, long and smooth. The fat of the ruminants hardens more in cooling than that of other quadrupeds, and becomes even brittle. It is called suet. The mammæ are placed between the thighs.

The ruminants are of all animals those from which man has the greatest advantages. He can eat all of them, and it is from them, in fact, that he derives almost wholly his animal food. Many of them serve as beasts of burden, others are useful for their milk, their fat, their hides, their bones, and other productions.

The two first genera have no horns.

The Camels, (Camelus, *Lin.*)

Approximate a little more than the others to the preceding order. They have not only always canines in the two jaws, but moreover two pointed teeth implanted in the incisive bone. The lower incisors six in number, and the cheek-teeth twenty or eighteen only. These attributes, as well as having the scaphoïd and cuboïd of the tarsus separate, they alone of all the ruminants possess. Instead of

the great hoof, flattened on the internal side, which envelops the whole lower part of each toe, and determines the figure of the ordinary cleft-foot, they have but one small one, which adheres only to the last phalanx, and of a symmetrical form, like the hoofs of the pachydermata. Their swelled and cleft lip, their long neck, their prominent orbits, the weakness of their crupper, the disagreeable proportion of their legs and feet, make them in some degree deformed beings, but their extreme sobriety, and the faculty they have of passing many days without water, render them extremely useful.

This faculty results probably from certain large collections of little cells, with which the sides of the paunch are furnished, and in which water is retained or continually produced. The other ruminants have nothing of the kind.

The camels urinate backward, but they copulate in the ordinary manner, though not without much difficulty. In the rutting season a fœtid humour is secreted on the head.

The CAMELS, *properly so called,*

Have the two toes united underneath, nearly to the point, by a common sole, and the back charged with lumps of grease. They are large animals of the old world, of which two species are known, both entirely subdued to a domestic state *.

* Pallas relates, on the word of the Buchares and Tartars, that there are wild Camels in the Desert of Central Asia; but we must observe that the Calmuks, from a religious principle, give liberty to all sorts of animals.

The Camel with two Bunches, (Camelus Bactrianus, L.) Buff.
XI. XXII.

Originally of Central Asia, and which descends toward the South much less than

The Camel with One Bunch (Camelus Dromedarius, L.) Buff.
XI. XI.

Which is spread from Arabia, in all the north of Africa, and in a great part of Syria, Persia, &c.

The first is the only one used in Turquestan, Thibet, &c.: it is employed as far as near Lake Baïcal. The second is very well known as essential in traversing the desert, and as the only means of communication between the countries which border upon it.

The Camel with two bunches succeeds best in humid soils; it is larger and stronger than the other. In the moulting time it entirely loses its hair. The Camel with one bunch is the most remarkable for its sobriety; the *Dromedary* is properly a lighter variety, and more fitted for expedition.

The flesh and the milk of camels serve as food, and their hair for garments of the people who possess them. Both species become almost useless in stony countries.

The LAMAS, (AUCHENIA, *Illiger.*)

Have two separate toes, and are without humps. Only two distinct species are known, both of the

New World, and much smaller than the two preceding.

The Lama, or, in its wild state, *Guanaco*, (*Camelus Llacma*, *L.*) *Buff. Sup. VI.* XXVII.

As big as a stag, with the fur thick, and of chestnut colour, but which colour varies in domestication. It was the only beast of burden in Peru when that country was conquered. It carries upwards of one hundred and fifty pounds, but is capable only of small journeys.

The Vigogna, or Paco, (*Camelus Vicunna, L.*) *Buff. Supp. VI.* XXVIII.

About the size of a sheep, covered with yellow wool of admirable fineness and softness, which is made into very valuable stuffs ; it hangs like long silk on the breast.

The MUSKS, (MOSCHUS, *L.*)

Much less anomalous than the camels, differ from the common ruminants only in the absence of horns, in having long canine teeth on each side of the upper jaw, and in having a delicate peronæum, which is not found in the camels. They are delightful animals, as well by their elegance as their agility.

The Musk, (*Moschus Moschiferus, L.*) *Buff. Supp. VI.* XXIX

Is the most celebrated species, of the size of a

goat, without a tail. It is entirely covered with hairs, so thick and so brittle, that we may almost call them spines. But that by which it is more especially remarkable is the pouch, situated in front of the prepuce of the male, and which is filled with that odoriferous substance so well known in medicine and perfumery under the name of musk.

This species appears to be proper to that rocky country, from which descend the principal part of the rivers of Asia, and which extends between Siberia, China, and Thibet. Its life is nocturnal and solitary, and its timidity extreme. It is at Thibet and Tunkin that it gives the best musk; in the north this substance has scarcely any smell.

The other Musks have no musk-pouch. They all live in the hot countries of the old continent*; they are the smallest and most elegant of all the ruminantia †

All the rest of the ruminants have, at least in the male sex, two horns, that is to say, two prominences of greater or less length of the frontal bones, which is not found in any other family of animals.

In some these prominences are covered with a case of elastic substance, composed like agglutinated hairs, which increase by depositions, and during all the life of the animal; the name of horn is given

* The *Moschus Americanus*, established from Seba, is nothing but the young, or the female of one of the stags of Guiana.

† *Moschus Pygmæus*, Buff. XII. XLII. *Moschus Memina*, Schreb. CCXLVII. *Moschus Javanicus*, Buff. Supp. VI. XXX.

especially to the substance of this case, and the bony process is called the horn-mould *(corne creuse)*. The prominence which the horn envelops increases, like the horn itself, during the life of the animal, and never falls. Such are the horns of the ox, sheep, goat, and antelope.

In others the prominences are enveloped only by a furry skin, which is in continuation of that of the head, and which is not destroyed. These prominences also do not fall off; the Giraffe alone has this kind of horns.

Finally, in the cervine genus, the prominences covered for a time with a skin, furred like that of the rest of the head, have at their base a ring of bony tubercles, which in growing compress and obliterate the feeding-vessels of this skin. It withers and falls off: the bony prominence thus denuded separates, after a certain time, from the cranium to which it was attached: it falls, and the animal remains without horns. But it quickly sends out new ones, in general larger than their predecessors, and destined to undergo the same revolution. These horns, purely bony, and subject to periodical changes, are called antlers.

The Stags, (Cervus.)

Are, then, all the ruminants whose head is armed with antlers; but, if we except the Rein-deer, the females are always without them. The substance of these antlers, when it has acquired its

whole development, is a bone very dense, without pores or sinus. Its figure varies considerably according to the species, and even in the same species at different ages. The Stags are excessively rapid, live generally in woods, on grass, leaves, boughs of trees, &c.

The species with horns, either partially or altogether flattened, may be first distinguished, *viz.*,

The Elan, (*C. Alces, L.*) *Elk*, or *Elend* in the north of Europe, *Moose Deer* of the Americans. *Orignal* of the Canadians. *Buff. Supp. VII.* LXXX.

As big as a horse, and sometimes larger, with high legs, the muzzle cartilaginous and swollen; a sort of goître or pendulous swelling, variously shaped, under the throat; the fur is always very rough, and of an ash-colour, more or less deep. The antlers of the male, at first simple (*d'abord en dague*), afterwards become ramified; assume, at five years old, the form of a triangular plate, indented on the external edge, and mounted on a pedicle. They increase with age, so as to weigh fifty or sixty pounds, and to have fourteen antlers or indentations to each horn. The Elan inhabits in small troops the marshy forests of the north of the two continents. Its skin is valued for manufacturing purposes.

The Rein-Deer, (*C. Tarandus.*) *Buff. III.* XVIII. *bis.*

As large as a stag, but with the legs shorter and thicker. Both sexes have the horns divided

into many branches, at first thin and pointed, but which become by age terminated in enlarged and indented palms. Its fur, brown in summer, becomes white in winter. The Rein-deer inhabits none but the icy countries of the two continents. This is the animal so celebrated for the service the Laplanders derive from it. They keep them in numerous troops, lead them in summer into the mountains of their country, and in winter bring them back to the plains, make them beasts of burden and of draught, eat their flesh, drink their milk, and clothe themselves with their skin.

The Fallow-Deer, (*C. Dama, L.*) *Buff. t.* XXVII. XXVIII.

Less than our stag, in winter of a blackish-brown, in summer yellow, spotted with white, the buttocks white at all times, bordered on each side with a black stripe, the tail longer than that of the stag, black above, white underneath; the horn of the male is round at the base, with a pointed antler; after a certain age it increases, or becomes, as it were, patched, and divided irregularly into many flat ramifications. This species, which is the *Platiceros*, and not the *Dama* of the ancients, is common in all the countries of Europe; a black variety without spots is sometimes found.

The species with round horns are more numerous; those of temperate climates also change more or less in colour during winter.

The Common Stag, (Cervus Elaphus.) Buff. VI. IX., X., XI.

Yellowish-brown in summer, with a blackish line, and on each side a range of little pale yellow spots along the spine; in winter of an uniform grey-brown; the crupper and tail pale-yellow at all times. It is a native of the forests of Europe, and the temperate parts of Asia. The horn of the male is round, and appears the second year, at first in a simple form, and then takes more branches or antlers as it advances in age, and terminates with a sort of palm, having many small points. When very old they become blackish, and the hair of the neck lengthens, and becomes erect, and it is then that Aristotle calls them *Hippelaphos*. The horn falls in the spring, the old ones losing them first; it returns during summer, and the stags live separately during this time. At that time commences the rutting season, which continues three weeks, and during which the males are almost furious. Both sexes unite in large troops to pass the winter. The hind is pregnant eight months, and brings forth in May; the fawn is yellow, spotted with white.—Stag-hunting, which is considered the noblest of exercises, has become an art which has its theory and an extended terminology, in which the commonest things are expressed by whimsical terms, or perverted from their common acceptation.

The Canadian Stag, (*C. Canadensis. Gm. C. Strongyloceros, Schreb.* CXLVI. A., CXLVII. F. G.) *Elk*, or *Elan*, of the Anglo-Americans.

Larger than ours, of the same colour, with the horns equally round, but more developed, and which never take a flat or palmated form; may probably be only a variety of the common stag. It inhabits all the temperate parts of North America.

The Stag of Louisiana, or *Virginia*, (*C. Virginianus, Gm.*) *Fallow-deer* of the Anglo-Americans. *Mazame* of Mexico*.

Less than ours, more slender, the muzzle more pointed, bright yellow in summer, reddish-gray in winter, under part of the throat and tail white at all times, the lower third of the tail black, and the end white. The horn of the male round, smooth, and whitish, deviates outward to form a circular arch inward and forward; it never has more than three antlers.

The species of the warm countries do not change their colour.

The Indian Stag, or *Axis*. (*Cervus Axis, Lin.*) *Buff. XI.* XXXVIII. XXXIX.

Yellow at all times, spotted with pure white, the under part of the throat and tail white; tail yellow, bordered with white on the upper side;

* The *Cariacou*, Daub. XII. XLVI. is its female.

the horns are round, and become very large with age, but never have more than one antler toward the base, and the point forked. Originally of Bengal, but propagates easily in all countries. The species with little horns are called Roebucks.

The Roebuck of Europe, (*Cervus Capreolus, Lin.*) *Buff. VI.* XXXII. XXXIII.

Yellow-gray, with white haunches, without lachrymal sinus, almost tailless; the horns of the male short, erect, forked at the extremity, with an antler in front of the trunk of the horn. There are some individuals bright-red and others blackish. This species lives in couples in the elevated forests of the temperate parts of Europe; loses its horns at the end of autumn, reproduces them during winter, enters into heat in November, and is gravid nine months and a half. The flesh is much more esteemed than that of the stag. There are none in Russia.

The Roebuck of Tartary,(*C. Pygargus, Pal.*) *Schreb.* CCLIII.

Similar to ours, but with the horns more prickly at the base; the hair longer; nearly of the size of a deer. It inhabits the elevated countries on the other side of the Volga.

The Roebuck of India, (*Cerv. Muntjac, Gm.*) *Buff. Supp. VII.* XXVI.

Smaller than ours, with a tail, lachrymal sinuses,

small canine teeth like the stag, and the horns deeply cleft, but elevated on long prominences of the frontal bone, between which is a plaited elastic and unctuous skin. It lives in small troops, in Ceylon and Java. Its fur, white at the base, brown at the point, has hence a grayish tint.

America also produces different species of the Roebuck, but which have been hitherto but ill defined. As these are all of the warm parts of this country, they do not change their colour, and have no fixed periods for changing their horns.

Some have the horns arched, with as many as five antlers, according to their age, while others have them always in form of a dagger *.

The GIRAFFE, (CAMELOPARDALIS, *Lin.*) *Buff. Supp. VII.* LXXXI.

Has for its character in both sexes conical horns, always covered with a furry skin, and which never fall. It is moreover one of the most remarkable of animals by the length of its neck, the dispropor-

* The Roebuck of America, *Buff. VI.* Pl. XXXVII., has the horns large, short, arched, with five very tuberculous antlers toward their base. If this, as it appears to be, is the *Gouazou Poucou* of D'Azara, it must be as big as our stag, of a reddish colour, with the upper part of the tail and end of the feet black, inhabiting humid places. It is its horns which Pennant represents under the name of *Cervus Mexicanus*. The *Gouazou Pita* which we have in the Museum, is smaller than a Roebuck, of a bright marron-red, with white at the end of the lower jaw. We have moreover seen two heads with simple or dagger-shaped horns; yellow-gray; one of the size of the deer, the other of the roebuck. This is called *Carácou*, at *Cayenne*.

tionate height of its fore-legs, and by a bony tubercle which it has upon the forehead.

Only one species is known (*Camelopardalis Giraffe*, L.) confined in the deserts of Africa, with short gray hairs, sprinkled with irregular yellow spots, with a slight main, gray and yellow, which passes from the ears to the crupper. It is the tallest of all animals, for its head attains eighteen feet in height. It is of a gentle disposition, and lives on the leaves of trees. The Romans had living Giraffes at their games.

The Ruminants with Hollow Horns

Are more numerous than the others, and it has been necessary to divide them into genera, from characters of slight importance, drawn from the form of the horns, and the proportions of their different parts.

M. Geoffroy has advantageously joined to these those which give the substance of the frontal prominence or bony nuts of the horn.

The Antelopes (Antilope*).

Have the substance of their bony nut solid, and without pores or sinews like the horns of stags. They resemble, moreover, the stags by the lachrymal sinuses, by their lightness and swiftness. It is a very numerous genus, which has been necessarily subdi-

* This name is not ancient; it is corrupted from *Antholopos*, found in Eustathius, an author of the time of Constantine. The common gazelle has been well described by Ælian, under the name of *Dorcas*, which is probably that of the roebuck. Gazel is Arabic.

vided, principally according to the form of the horns.

a. Horns annulated with double or triple flexures, points forward or inward, or vertical.

The Gazelle. (Ant. Dorcas, Lin.) Buff. XII. XII.

With the horns round, thick, and black; with the elegant make of the roebuck; light yellow above, white underneath; a brown band along each flank; a bunch of hairs on each knee; a deep pouch at each groin.

It lives in all the north of Africa in countless troops, which form a circle when they are attacked, and present their horns in every direction. It is the common repast of the lion and panther. The gentleness of its appearance furnishes numerous images for the amorous poetry of the Arabs.

The Corinne. (Ant. Corinna, Gm.) Buff. XII. XXVI.

Differs from the last only in having the horns much more slender. It is, perhaps, only a variety.

The Kevel. (Ant. Kevella, Gm.) Buff. XII. XXVI.

Is again very similar, but the horns are compressed at their base, and have more rings. It is pretended that this differs from the *Ahu* of Kæmpfer, or the *Treyzain* of the Persians and Turks, (*Ant. Subgutturosa, Gm.*), because a

slight swelling has been observed under the throat and chin.

The Dseren of the Mongoles. *Hoang-yang, or Yellow Goat* of China (*Ant. Gutturosa. Pall.*), *Schreb.* CCLXXV.

Presents again almost the same distribution of colours and the same horns as the Gazelle, properly so named, but in size it approaches the Deer, and the male has a strong protuberance, produced by the larynx, and a large pouch under the belly. The female has no horns. This species lives in troops in the dry plains of central Asia, and avoids both water and the forest.

The Springbock, or Pouched Gazelle (*Ant. Euchore. Forst.*), *Buff. Supp. VI. pl.* XXI.

Numerous herds of this species fill the south of Africa; it is larger than the Gazelle, but of the same make and colour; and distinguished by a fold of the skin of the croup, furnished with white hairs, which opens and enlarges at every leap made by the animal.

The Saiga (*Ant. Saiga. Pall.*) *Colus of Strabo. Schreb.* CCLXXVI.

Inhabits Hungary and the south of Poland and Russia, it has the horns of the Gazelle, but they are yellowish and transparent. It is as large as a deer. Its fur yellow in summer becomes

whitish gray in winter. Its cartilaginous, thick, and swelled muzzle, with very open nostrils, obliges it to feed in retrograding. The species sometimes unite in herds of ten thousand.

The Antelope of India (*Ant. Cervicapra, Pall.*), *Buff. Supp. VI.* XVIII. XIX.

Is also very similar to the Gazelle, but its horns have a triple flexure. They make offensive weapons of them in India by uniting two with the points opposed. The female is without horns *.

b. Horns annulated with a double bend, but contrariwise to the preceding subdivion, and the point backward.

The Bubalis of the Ancients (*Ant. Bubalis, Lin.*), vulgarly the *Barbary Cow*. *Buff. Supp. VI.* XIV.

With heavier proportions than the other species, the head long and thick, of the size of a stag, with yellow fur, except the end of the tail, which is terminated by a black tuft. Common in Barbary.

The Caama. (*Ant. Caama, Cuv.*) The *Cape Stag* of the Hollanders. *Buff. Supp. VI. pl.* XV.

Similar to the preceding, but with the curves

* To this subdivision also belongs the *Purple Antelope. (Ant. Pygarga.)* Schr. CCLXXIII., and the *Boba, (Ant. Senegalensis)*, the horns only of which are known, *Buff. XII. pl.* XXXII. 2, unless it be the same as the *Pallah* of S. Daniels, *African Scenery, pl.* IX., which much resembles the Gazelle, but is larger.

of the horns more angular; a space round the base, a band on the bottom of the forehead, a line on the neck, a longitudinal band on each leg, and the end of the tail black. Common at the Cape.

c. Horns annulated, straight, or little bent.

The Oryx (*Ant. Oryx, Pall.*), ill-named *Pasan* by Buffon. *Supp. VI. pl.* XVII. *Cape Chamois* of the Hollanders.

Size of a stag, with slender horns, two or three feet long, straight, pointed, round, annulated obliquely at the lower third, smaller in the female; fur ashy, head white, barred with black; a black band on the spine, and one on each flank; a deep brown spot on the shoulders, and one on the thigh. The tail long and blackish, and the fur of the spine directed toward the neck. This singular animal is the Oryx of Ælian, and it is from an individual which had lost one horn that the idea first originated of the Unicorn, so celebrated by the discussions it has occasioned. It is found to the north of the Cape and in the interior of Africa. Its hoofs longer than in the other species facilitate its climbing rocks, and it frequents mountainous countries by preference*.

* The *Ant. Leucorix.* Schreb. CCLVI. B, and *Ant. Gazelle*, appear to be only varieties of the *Oryx*; but the *Klip-springer*, (*Ant. Oreotragus.*) *Buff. Sup. VI. pl.* XVII., the *Grim*, (*Ant. Grimmia*). id. ib. *III. pl.* XIV.

d. Horns annulated with a simple bend, the point backward.

The Blue Antelope (*Ant. Leucophæa, Gm.*). Commonly called the Blue Goat, ill-named *Tseiran. Buff. Supp. VI. pl.* XX.

Rather larger than the Stag, of a bluish ash colour, the horns large in both sexes, uniformly bent, and with more than twenty annúli.

The Equine Antelope (*Ant. Equina, Geoff.*)

As large as a horse, reddish gray, head brown a white spot before each eye, a mane on the neck, &c.

e. Horns annulated with a simple bend, the points forward.

The Nanguer (*Ant. Dama, Lin.*), probably the *Dama* of Pliny, *Buff. XII. pl.* XXXIV.

As big as a roebuck, yellow, the neck, the under part of the body and the hind part white. From Senegal*.

f. Horns with spiral ridges.

and the *Guvey, (Ant. Pygmea,)* have short horns, so little bent that they might be referred to this section. The *Duiker,* or *Plunging Goat of the Cape,* which Allamand confounded with the *Grimme* and the *Ourebi, (Ant. Scoparia,)* Schreb. CCLVI. appear to be nearly allied to them.

* To this subdivision belongs the *Nago, (Ant. Redunca, Buff. XII. pl.* XLVII. The *Rict-reebock,* or *Reed Antelope, (Ant. Ecleotragus,)* Schreb. Schr. CCLXVI. *(Ant. Arundinacea,* Shaw,*) Buff. Supp. VI. p.*

The Canna (*Ant. Oreas. Pall.*). *Cape Elk* of the Hollanders. Named improperly *Coudous* by *Buff. Supp. VI.*, *pl.* XII.

As large as the strongest horse, with thick straight conical horns, surrounded with a spiral ridge; fur grayish, a slight mane along the spine, a sort of dew lap under the neck, the tail terminated by a tuft. It lives in troops in the mountains north of the Cape *.

The Coudous (*Ant. Strepciseros, Pall.*), improperly named *Condoma* by *Buff. Supp. VI. pl.* XIII.

As large as a stag, gray brown, striped across with white; large horns in the male only, smooth, with a triple bend, and a single longitudinal ridge slightly spiral; a little beard under the chin, a mane along the spine. Lives insulatedly northward of the Cape.

g. With smooth horns.

The Nylgau (*Ant. Picta et Trago Camelus*), *Buff. Supp. VI. pl.* X. *and* XI.

As large or larger than a stag, the horns short,

XXIII. and XXIV. This species is probably the same as the *Kob, (Ant. Kob,)* of which the horns only are known. *Buff. XII. pl.* XXXII. *f.* 1. The *Griesbock*, the *Steinbock*, and the *Beckbock* of Forster, *Buff. Supp. VI.* p. 186, should also belong to it.

* Near to the *Canna* ought to be placed the *Guib*, (*Ant. Scripta.*) *Buff. XII. pl.* XL.; the *Bosch-bock (Ant. Sylvatica.) Buff. Supp. VI.* XXV.

bent forward, a beard under the middle of the the throat, the fur grayish, black and white rings on the feet; the female without horns. This species belongs to India.

The Chamois (*Ant. Rupicapra, L.*), *Buff. XII. pl.* XVI. *Ysard* of the Pyrenees.

The only ruminant in the west of Europe that can be compared with the Antelope; has, nevertheless, particular characters; its straight horns are suddenly bent backward, like a hook; behind each ear, under the skin, is a sac, which opens outwardly by a little orifice. The size of the Chamois is that of a large goat. It has the fur deep brown, with a black band descending from the eye toward the muzzle. It runs with the greatest agility among steep rocks, and continues in small troops in the middle regions of the highest mountains.

The Gnou, or *Niou* (*Ant. Gnu. Gm.*), *Buff. Supp. VI. pl.* VIII. and IX.

Differs still more than the Chamois from the Common Antelope, and seems, even at first view, a monster composed of parts of different animals. It has the body and crupper of a small horse, covered with brown fur; the tail is furnished with long white hairs, like that of a horse, and on the neck is a handsome straight

mane, white at the bottom, and black at the end of the hairs. The horns approximated and enlarged at their base, like that of the Buffalo of the Cape, descend outwardly, and turn up at the point. The muzzle is large, flat, and surrounded with a circle of projecting hairs; under the throat and dewlap is a second black mane. The feet have all the lightness of those of the Stag. Both sexes have horns.

This animal lives in the mountains northward of the Cape, where it appears to be very rare,—the ancients, nevertheless, had some knowledge of it *.

The three remaining genera have the bony core of their horns occupied principally by little cells, which communicate with the frontal sinus. The direction of their horns has furnished the characters for their division.

The GOATS (CAPRA, *L.*),

Have the horns directed upward and backward. Their chin is generally furnished with a long beard, and their forehead concave.

The Ægagre, or Wild Goat, (*Capra Ægagrus, Gm.*) *Cuv. Menag. du Mus.* in 8vo., *II.* 177.

Which appears to be the stock of all the varie-

* It is probably this animal which has given occasion for their *Catoblepas.* See Pliny, lib. VII. c. XXXVI. and Ælian, lib. VI. c. V.

ties of our domestic goats, is distinguished by its horns, edged in front, very large in the male; short, and occasionally none, in the female, which is sometimes the case in the two species of Ibex. It inhabits the mountains of Persia gregariously, where it is known under the name of *Paseng*, and perhaps also the mountains of many other countries, even the Alps. The oriental bezoar is a concretion found in its intestines.

The Goat and the domestic species (*Capra Hircus*) vary infinitely in size, colour, the length and fineness of the fur, size and number of horns. The Angora Goats in Cappadocia have the longest and most silky fur. The goats of Guinea, called Mambrines, and Whida, are very small, and have the horns reclining backwards. All these animals are robust, capricious, wandering, feeling their mountainous origin, preferring dry and wild places, and living on coarse grass and the shoots of young trees. They are very injurious to the forests. Scarcely any but the kids are eaten, but their milk is useful in many diseases. The female can produce at seven months, her gestation is five months, and she generally has two at a birth. The male can propagate at a year old; one will suffice for more than one hundred females; he is old at five or six years.

The Bouquetin, or Ibex (*Capra Ibex, L.*), *Buff. XII. pl.* XIII.

Has large horns, square in front, and marked

with prominent transverse knots. It inhabits the most elevated summits of the highest chains of mountains of the whole ancient continent.

The Caucasian Ibex (*Capra Caucasica*), *Guldenst. Act. Petrop.* 1779. *II. pl.* XVI. XVII.

Is distinguished by large triangular horns, obtuse, but not square in front, knotty like those of the preceding. The two species mix with the Domestic Goat *.

The SHEEP (*Ovis*),

Have the horns directed backward, and returning spirally, more or less in front; their forehead is generally convex, and they are without a beard. They so little merit being separated generically from the goats, that they produce a prolific mongrel breed. As in the Goats, there are several races or wild species very nearly approximated.

The Argali of Siberia (Ov. Ammon, L.), Pall. Spic. XI. I.

The male of which has very thick horns, with the base triangular, rounded at the angles, flattened in front, striped across; and the female with the horns compressed, and in form of a

* Add. The maned Bouquetin of Africa. Takaitre of S. Daniel's *African Scenery, pl.* XXIV.

scythe. Its summer fur is short yellowish-gray; the winter fur is thick, hard, reddish-gray, with white, or whitish, on the muzzle, throat, and under the belly. There is at all times, as in the Stag, a yellowish space round the tail, which is very short. This animal inhabits the mountains of all Asia, and becomes as large as a fallow deer.

The Mufflon, or Mufione of Sardinia, Muffoli of Corsica, Buff. XI. pl. XXIX.

Differs from it in not being so large, and the female is without horns, or, if with them, very small. It is said to be found also in Crete. There are varieties, partially or altogether black, and others more or less white.

There is reason to think that

The Mouflon of America (*Ov. Montana*), *Geoff. An. Mus. II. pl.* LX. *Schreb.* CCXIV. D.

Is a species of Argali, which has been able to pass the sea on the ice. Its horns are very thick, and are more completely spiral than in the common species.

The Mouflon of Africa (*Ov. Tragelaphus, Cuv.*), *Pen. No. XII. Shaw. pl.* CCII. 2.

With the fur soft and reddish, with a long pendant mane under the neck, and another at each

wrist; the tail short; appears to be a distinct species. It inhabits the rocky countries of the whole of Barbary, and M. Geoffroy has observed it in Egypt.

It is from the Mouflon, or the Argali, that we are supposed to derive the numerous races of our woolly animals, which, next to the Dog, seem most subject to vary.

We have them in Europe with common wool, in size large or small; with horns, large or small, without horns in the female, and in both sexes without. The most interesting varieties are those of Spain, with fine crisp wool, large spiral horns in the male, and of England with fine and long wool. A variety begins to spread throughout Europe.

The most extended variety in southern Russia has a very long tail; those of India and of Guinea, which also have the tail long, are distinguished by their long legs, convex forehead, pendant ears, and by the absence of horns and short wool. The north of Europe and of Asia has almost everywhere small sheep, with a very short tail.

The race of Persia, Tartary, and China, has the tail entirely transformed into a double globe of fat, that of Syria and Barbary has it, in truth, long, but also charged with a suety mass of fat. In both, the ears are pendant; the horns thick in the rams, moderate in the other sex and in the lambs, and the wool mixed with fur.

Sheep are everywhere valuable for the flesh, suet,

milk, skin, fur, and dung; their flocks, well managed, carry fertility everywhere.

Lambs are weaned at two months old, are castrated at six, and change their milk-teeth between one and three years old. The young can procreate at a year, and produce till ten or twelve; gestation continues five months; they bring two young at a time. The ram arrives at puberty in eighteen months; and suffices for thirty females. They are fatted when about eight years old.

The Ox (Bos, *Lin.*),

Has the horns directed sideways, turning upward or forward, in form of a crescent; they are moreover large animals, with a large muzzle, low structure and stout legs.

The Common Ox (*Bos Taurus, L.*), *Buff. IV.* XIV.

Has for its specific character a flat forehead, rather long than large, and round horns, placed at the two extremities of a ridge which separates the forehead from the occiput. In the fossil crania which appear to have belonged to this species in a wild state, these horns bend forward, and toward the base; but in the countless domestic varieties they have very different directions and sizes, and are sometimes altogether wanting. The common races of the torid zone have all a lump of fat on the shoulders, and there are some among the num-

ber which are scarcely bigger than the hog. All the world knows the utility of these animals for labour, for their flesh, fat, hides, and milk; their horn even is employed for useful purposes.

The cow is gravid nine months, and can breed at eighteen, the bull at two years. The male is mutilated at eighteen months or two years old, and is fattened at ten.

The Aurochs of the Germans, *Zubr* of the Polanders (*Bos Urus, Gm.*), *Urus*, or *Bison* of the ancients, *Gesn.* CLVII.

Passes generally, but improperly, for the wild stock of the horned cattle. It is distinguished from them by its prominent forehead, rather large than high, by the attachment of the horns below the occipital crest, by the height of its legs, by an additional pair of ribs, and by its grunting voice. It is a fierce animal, confined at present to the great marshy forests of Lithuania, of the Krapacs, and of Caucasus, but which formerly inhabited the whole of the temperate parts of Europe. It is the largest quadruped, after the Rhinoceros.

The Bison of America, *Buffalo* of the Anglo-Americans (*Bos Bison, L. Bos Americanus, Gm.*), *Buff. Supp. III.* v.

Has not hitherto been sufficiently compared with the *Aurochs*. Its legs and tail appear shorter, the fur of its head and beard longer,

&c. It inhabits the whole of the temperate parts of South America.

The Buffalo (*Bos Bubalus, Lin.*), *Buff. XI.* XXV.

Originally of India, and brought into Egypt, Greece, and Italy during the middle ages, but unknown to the ancients; with the forehead convex, more long than large, the horns directed sideways, and marked in front with a longitudinal ridge. It is a difficult animal to subdue; it has great power, and prefers marshy places and coarse plants, which the ox cannot live on. Its milk is good; its hide very strong, but its flesh is little esteemed.

There is a race of them in India with the horns opening ten feet; it is called *Arni* in Hindustan, and is the *Bos Arni* of Shaw.

The Yack (*Bos Grunniens, Pall.*), *Buffalo* with horse's tail. *Grunting Cow* of Tartary, *Schreb.* CCXCIV. A. B.

Is a small species, with the tail entirely furnished with long hairs, like that of the horse, and with a long mane on the back; its head appears to resemble that of the Buffalo, but its horns are not hitherto sufficiently described. This animal, of which Ælian has spoken, is originally of the mountains of Thibet. It is with its tail that the standards still in use among the Turks were first made, to distinguish the superior officers.

The Cape Buffalo (*Bos Caffer, Sparm.*), *Schreb.* cccı.

Has very large horns, directed sideways and upwards, remounting at the point, flat, and so large at their base that they nearly cover all the forehead, leaving between them only a triangular space, the point of which is upward. It is a very large animal, extremely ferocious; inhabits the woods of Caffraria.

The Musk Ox of America (*Bos Moschatus, Gm.*), *Schreb.* cccıı. The Head, *Buff. Supp. VI.* ıı.

Has the horns close, and directed like the preceding, but meeting on the forehead by a right line; the female has them smaller and separated. It is low on the legs, covered with a tufted fur which hangs to the ground. Its tail is extremely short; it emits more powerfully the musky odour common to all the genus. It is only seen in the coldest parts of North America, but it appears that its scull and its bones have sometimes been carried by the ice to Siberia. The Esquimaux make bonnets of the tail, the fur of which falling on their visage defends them from the musquitoes.

SUPPLEMENT TO THE ORDER RUMINANTIA.

By Major CHARLES HAMILTON SMITH,
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In reviewing the Ruminantia, it appears necessary to extend the observations on their character and structure, somewhat beyond the strict outline which Baron Cuvier has furnished, in the definitions of this order. For this purpose we shall combine a few extracts from the works of comparative anatomists of this country, on the internal structure of the animals in question, with some remarks taken from our author's able work on fossil bones, so as to supply a more distinct conception of the final causes for which they were created, and by which they exist.

Ruminating animals, in common with most quadrupeds, have the legs shorter in proportion to the length of the trunk, and their spines more flexible than man; by means of this formation, their progressive motion is facilitated, and their food attained with ease. In most species the epiglottis covers the rima entirely, having no apparent uvula, but a gland secreting mucus to lubricate the food, and to act at the same time as a valve to prevent the substance swallowed from returning into the mouth, while the animal feeds, which is mostly with the head downwards: this gland is placed on the upper part of the pharynx behind the cricoid cartilage. In the skull the parietal bones form but one, assuming the shape of a belt, behind and above the frontals; these are very long, and form a powerful arch over the orbits to secure the eyes, and give a firm seat to the roots of the horns.

By the length of the nose and the convolute surface on which the Schneidarian membrane is stretched, ruminants are endowed with an acute sense of smelling, necessary for the nice selection of their food, in the choice of which the preference is so predisposed, that while nearly all the genera and species will feed on the most common plants, each have some particularly grateful or harmless to them, so that scarce any exist that are not adapted to this special end of subserviency to animated nature. Their ears are placed far back and very moveable, the most advantageous position for hearing behind the animal while feeding, because at that moment it is most exposed to unseen danger, the attention and eyes being engaged in a great measure before it: the pupil of the eyes, in the whole order, is invariably of an oblong form, enabling them to take a more extensive horizontal range of vision without turning the head or lifting it from their food. The eye is furnished with a nictitating membrane stretching from the inner canthus to nearly half over the ball, thus protecting those organs from danger while in search of their food. In common with other quadrupeds, they possess a seventh muscle of the eye, called suspensorius, fixed in the sclerotic coat, and intended to sustain the weight of the orb, and to prevent the optic nerve being stretched; the posterior part of the cricoid coat, called the tapetum, is, in them, generally of a green passing into a blue colour, to enable them to see their food the better, and facilitate vision in the dark.

To the strength of their skulls, already noticed, are added in most species, osseous prolongations from the forehead, forming either sessile antlered horns, or bony cores, upon which the horny covers vaginate and construct true horns: these serve for defence, and for conquest among themselves in the strife for females, it being intended by nature that the most powerful should chiefly procreate the breed, and thus transmit the character of the species in full vigour to posterity.

The neck is in general lengthened, so as in conjunction with the maxillæ, which are also long, to reach their food with greater ease. The spinous processes of the vertebræ of the neck diminish in proportion to its length. The ribs are broad and thick. The tuberosity near the head of the humerus or thigh-bone of the atlantal extremity, and the rough edge of the bone, give greater space for the insertion of strong muscles; and the two bones of the fore-leg, (radius and cubitus,) nearly grown together, give great firmness to the anterior limbs, facilitate forward movement, and prevent nearly all lateral motion; the toes, externally appearing as two only, are in number the same as in other animals, though all are not equally developed.

The haunch-bone is shaped like a hammer, with the anterior part of the spine extremely large, furnishing room for broad and strong muscles, for the same purpose as in the atlantal, and for defence, by adding great force in kicking; the extremities collectively being admirably adapted to sustain the heavy mass which constitutes the trunk.

As there is in the text of the Animal Kingdom a full detail of the four stomachs which the animals of this order possess, we shall only subjoin that, by their united action, the food is so completely digested, and converted into chyle, that they can subsist, in proportion, upon a much smaller quantity than horses or asses, whose organization not being the same, void theirs very little altered, and, consequently, want a greater quantity: hence also their dung is less useful as manure than that of horses.

The season of copulation is periodical in all the species of this order; and announces itself after the period when their food has been most abundant, when the horns of some genera have been reproduced; of others, when their bony core has received its increase, and the horny sheath prolonged by additional ringlets at the bottom; when, in the hornless species, a fetid humour is distilled from orifices in

the back of the head, the pouch near the prepuce is filled with musky matter, or discharges take place at the nose; secretions which perhaps carry off the superabundance of a fluid, which, under other combinations, is productive of the osseous increase of the horns in some, or of their regeneration in others: when these symptoms, singly or collectively, have appeared in the males, they become more restless and bolder than before, they use their voice, and are pugnacious. With the females gestation is so arranged by the unerring law of nature, that parturition does not come on until renovated verdure supplies ample means of subsistence, and of concealment of their offspring; then in their turn, they become bold, daring and sagacious, until their young are able in a great measure to shift for themselves.

Of the instinctive faculties and intelligence of ruminating animals, we shall speak under the heads of their respective genera, excepting inasmuch as their faculties are operative collectively, and between one genus and another. Although we know but little of these qualities in animals, the most obvious species of which are degenerated in this particular, by the interventional care of man; yet we may infer, that even those degraded creatures, unused as they are to exercise their instinct, have the means of communicating not only the wants of one individual of a species to another, but also of one genus to another. The following fact, which happened before our eyes, may serve as a proof of this opinion:—

During an afternoon walk with a friend on a hill near Coventry, we observed several sheep standing with steadfast looks round the head of a cow which was grazing: their fixed attitude attracted our attention, and as we came up, the Cow suddenly raised her head, and the Sheep opened before her, as we imagined, to go out of our way; she did not, however, proceed more than a dozen yards before she reached a gravid Ewe, which, hitherto unnoticed

by us? had fallen over on her back, and was unable to recover herself from that perilous position. The Cow placed the tip of her horns close under the side of the animal, and gave a slight toss, so dexterously managed, as to enable the Ewe to get instantly on her feet; meantime the other sheep had dispersed, and the two animals walked their way.

The Camels. (Camelus, Linn.)

The name by which these animals are generally known in Europe, is evidently derived from an eastern root—Djemel of the Arabs, Gamel or Gimal of the Hebrews, and points out the quarter where they have been domesticated from a period anterior to all historical documents. In the systematic arrangements of the ruminating order, authors place them at the head of the series, because they possess exclusively some characters, which indicate still an affinity with the Pachydermous families, and others which are strictly their own. Among the former are the anomalous character of the teeth, a thick hide, and the horny soles of their feet; among the latter, that additional pouch or large fold in the paunch, serving as a reservoir for water, and the structure of the urinary apparatus, which renders them retromingent: but the presence or absence of the hunch or hunches on the back, and the callosities on the sternum and joints may be questioned, some eminent naturalists having even asserted, that they were not natural but accidental characters, the result of long subjection and absolute slavery.

Notwithstanding the assertion of the Negroes, that camels in a wild state are still to be found in the mountains of Central Africa, and of others, that an unreclaimed species exists in the country of the Calmucks; it may be doubted whether they be other than strayed or emancipated individuals*.

*According to M. Desmoulins, the Camel existed in a wild state in Arabia in the time of Artemidorus, or the period of Hadrian.

We can therefore only view them as they exist ir a domestic character, and as such they must be regarded as one of the most important conquests of man over the brute creation. Nor can we consider the victory thus obtained as the result of force alone, when the stature and power of the animal, the obstinacy and fierceness with which he resists ill treatment in his present condition, be taken into account; much, nay most, should be ascribed to a confident nature in the creature and persevering gentleness in man.

The teeth of the Camel offer molars possessed of the general character of the Ruminantia, but they do not present a continuous series in the upper maxilla; the foremost, in the shape of a crook, being separated from the others, and placed midway in the diastema, or interval in the mouth, between the molars and the incisors. Before these are two strong canines, and what is more singular, instead of a total absence of incisors in the upper jaw, as obtains in all other ruminants, two corresponding to the lateral ones appear, and have likewise the form of canines; so that the animal shews three of them on each side of the upper maxilla. Below, the two external incisors assume a corresponding pointed form, and insert themselves between the upper incisor and the canine behind it; and the foremost of the molars, particularly in old animals, growing likewise in the diastema, with the forms of a canine, reduces the true grinders to five, and offers two of these pointed crooked canines on each side of that jaw.

The feet are divided into two toes without being separated, for a horny sole spreads from the heel forwards under the foot, uniting the middle part, and leaving the toes only free; these are protected by a short unguicular nail.

If to these distinctions we add the callosities of the sternum, and two on the joints of each leg, the linear form of the nostrils, the division of the upper lip, and the

hunches on the back, we have nearly all the external character of the Camel; but exclusive of these, its body is large, neck long and bent, ears short, eyes prominent and dull, and legs disproportioned, long, and meagre; exhibiting altogether an assemblage so ugly and stupid, that it requires all the partiality of Arabian eyes to perceive the propriety of that image in their poetry, which compares a young bride in her nuptial attire as "moving gracefully like a young camel." These apparent disproportions are however in reality only manifestations of that great will, which adapts everything with wonderful precision to its destined end: for in the hands of nature true disproportion is nowhere to be found; and although we cannot at all times point out the direct motive for given characters, yet in the case before us several may be assigned with confidence.

Thus the particular structure of the teeth indicate a predilection for food not obtained by grazing, but by browsing on shrubs, leaves, and branches, which require the action of powerful means to tear down and masticate; and although in Europe, or where fodder is plentifully served, the animal will pick with care the very best, we know that, in his native regions, he feeds on bitter artemisia, thistles, mimosas, and other thorny trees and shrubs, such as the guwasse, *&c.* For this particular purpose he is furnished with a divided upper lip, each separately moveable and slightly extensile; which he uses like palpi to feel, examine, touch, and to turn the substances into the mouth with great dexterity.

The nostrils having the form of slits, open and close at the will of the animal, and are admirably adapted to inhale the air, and exclude the acrid dust of the sandy deserts. To enable him to move with facility on a soft and sinking surface, his feet are broad and cushion-shaped, and his limbs long and elevated: he picks the thorny

bushes as he passes along without halting; and provided with the extraordinary apparatus in the ventriculus to carry water, he resists the burning heat for ten or even twelve days without drinking; and if, during this space of time, his food has been still more scanty than his sober habits demand, or the few dates, beans, or cakes usually in store for him are exhausted, the fat which composes almost the whole of the hunch or hunches on his back serves as an extra supply of nutriment: the hunches are reduced; their substance, re-absorbed, returns into the general circulation, and supports him to the end of the journey, or until he sinks under privations which no other animal, differently constituted, could have borne for half the period.

The Camel sees and hears well, but of all his senses that of smell is the most acute; by this beneficent provision, when long deprived of water, he will snuff the air and discover its presence at the distance of more than two miles, and disregarding all opposition, hasten to obtain it; stirring the water with his feet to a state of mud before he drinks. By this faculty of the Camel, whole caravans are sometimes saved from destruction, so that it is not only eminently useful to himself, but of the most vital importance to all who share his dangers and fatigues.

To the wild Arab of the desert, the Camel is all that his necessities require; he feeds on the flesh, drinks the milk, makes clothes and tents of the hair, belts, sandals, saddles, and buckets of the hide; he conveys himself and family on his back, makes his pillow of his side, and his shelter of him against the whirlwind of sand; couched in a circle around him, his camels form a fence, and in battle an intrenchment, behind which his family and property are obstinately and often successfully defended; the dung furnishes fuel and litter for the horses, and the urine produces sal ammoniac.

All these advantages are a necessary result of the con-

stitutional faculties and structure of the Camel, when residing in the locality assigned him by nature; under another atmosphere, his qualifications become less important, and his conformation less applicable. In Tartary and Southern Russia, where the Bactrian species (longer of body and shorter of limb than the Arabian) is harnessed to wheel-carriages, and even to the plough, the elevation of his shoulders evidently produces a waste of strength; and in a country where herbage and water are proportionably abundant, his sobriety is not required. If the Camel is transferred to rocky and mountainous regions, his feet soon wear, and he ascends and descends with great awkwardness. If he be brought into temperate regions, the frequent mud, and above all, the thawed snows, soften his feet, and he is unable to work; as is at least partially experienced in central and Northern Asia, notwithstanding that the Bactrian Camel, again provided by nature for his particular locality, has soles of greater hardness than the Arabian, and the dissolution of the snow is exceedingly rapid when once begun.

Although the Greek and Roman writers take universally as little notice of the Camel as an inhabitant of North-Western Africa or Egypt, as they speak repeatedly of him in Syria, Arabia, and the rest of Western Asia, we may conclude, from the above considerations, that the predestined habitation of the genus was on the sandy deserts of the Zahara, as well as the plains of Arabia, Persia, the Indies, and Southern Tartary.

The silence of profane writers is compensated by the 16th verse chap. xii. of Genesis, where Pharaoh, the King of Egypt, bestows camels upon Abram; consequently their presence in the valley of the Nile is established before the æra of the earliest Greek or Roman writers. In all obvious cases, the intelligence of man may be considered as acting in unison with the intentions of nature; now, as

this sagacity to appreciate his own interests had already in the earliest ages carried the Camel over India, China, and middle Russia, it is certainly rather surprising that the Romans, in their frequent wars in Northern Africa, should not have found them of sufficient importance to be mentioned, till Procopius first notices Camel-riding Moors in arms against Solomon, the Lieutenant of Belisarius: from that period, and most particularly during the progress of the sword of the Koran to Morocco, the Camel is the most striking, and considered the most useful, animal in the country. It is probable that this animal increased in proportion as agriculture diminished, at least the two facts are coeval. With the Koran, also, the Camels first crossed the Bosphorus, and spread with the Turks over their present dominions in Europe; the late Emperor Leopold, when Grand Duke of Tuscany, introduced them into Italy, where they have since multiplied considerably, and they would no doubt be useful in rural economy, if transferred to our colonies of the Cape of Good Hope, Sierra Leone, and the interior of New Holland.

The Camel, emphatically described by the Arabian epithet the *Ship of the Desert*, is in truth the link by which many nations separated by boundless wastes are connected, not only in all their commercial relations, but even in almost every communication: his strength, docility, and endurance of privations alone render the intercourse practicable: but it is only in those regions that his utility stands unrivalled; in other countries, as for example India, his qualifications are less pre-eminent, though certainly still invaluable. In that country thousands are employed to convey the baggage of the British armies, but they proceed with difficulty through broken ground; from the length of their legs, they are apt to, what is termed, split, or dislocate their limbs on slippery soil; still in prolonged forced marches they keep up better than elephants or

oxen. It is asserted that the Bactrian species will carry from one thousand to one thousand two hundred weight; but the Arabian, as used in India, seldom bears more than seven hundred, and under this load will move, at the rate of two and a half miles an hour; across the immense plains of the Zahara, where water and food are rarely dispersed, their journeys being necessarily longer, are made at the rate of three miles the hour, and the animals seldom carry more than four hundred weight.

The Camel was used in war long before the invasion of Egypt by the French. Without referring to the ancients, the Chinese employed them in 1755-9 against the Eleuths: their Military Mandarin and Commander-in-Chief, Akony, carried swivels on their backs. In India, camels similarly armed precede the Nabobs on occasions of state, to fire salutes; and the East India Company maintains a corps of dromedaries, mounted by two men each, and armed with musquetoons or swivels. Amongst the Arabs and Tartars the Camels are led out to browse on the pastures in large flocks, the males being kept separate from the females, and both return at night to the habitations; their tongue is soft and long, and they are particularly fond of salt. The males, more especially in the rutting season, are impatient and quarrelsome among each other. In their battles they bite with great vehemence, endeavouring at the same time to press their opponent down with the weight of their shoulders. In these struggles they *madden*, as the translator of Antar expresses it, at each other, with awkward fury, till one is compelled to fly, or is thrown down and trampled upon by the victor. At this period they are, on certain occasions of festivity, led out and made to fight for show; and we must not upbraid the patient cruelty that excites them to the combat, since this favoured country, with all its enlightened philanthropy, is not without its numerous abettors of similar disgraceful practices. Aleppo

appears to be the principal place where the combats of camels are among the public amusements.

But beside the use of his formidable teeth, in resisting the ill treatment of man, or the aggressions of dogs or hyænas, the Camel kicks with the hind feet and strikes with the fore. We have an instance related by an eye-witness of the dreadful bite of this animal, which happened in India, when a *Must* Camel (one furious in the rutting excitement) tore off the arm of a lad, whose person was with difficulty rescued from the further grasp of the ferocious beast; which, when the victim was withdrawn, stood in terrific exultation over the torn limb, nor suffered any one to approach it, till his attention was attracted by some other object. Under these paroxysms of fury, and also during copulation, they foam at the mouth, and protrude from between their teeth a membranous bag of a blood-red colour, which hangs on one or the other side of the mouth, and appears, by the late investigation of Professor Savi of Pisa, to be no other than the uvula, which, contrary to what we find the case in others, is in adults of this genus greatly developed, and so constituted as to be inflateable and protruded under certain circumstances of excitement. There remains, however, some doubt whether this organization is absolutely similar in all the Camels, it having been observed at Paris in some, and not in others, a circumstance which Mr. Ritcher of Königsberg considers as perhaps an indication of difference of species.

Although the external appearance of the Camel is disagreeable, his memory is good; this enables man to train him to lie down to receive his load, and again to be unloaded: some it is said will even assist in the performance of this business, but the burden imposed upon them must not exceed their strength, or they will refuse to rise, and become very obstinate. From the great docility and patience of the animal, evinced by the numbers which con-

stantly perish under their loads, it must be inferred that this obstinate refusal arises from the presentiment of their inability to perform the task imposed: the conviction of which is manifested to them when endeavouring to get the hind legs under them in rising, for they feel the weight in the first instance upon the loins, where Camels are weakest. Under the load which they will carry without compulsion, it is often observed in caravans, when the fatigue becomes excessive, that the Camels begin to perspire profusely, and if in this state they cannot be speedily relieved, they soon drop, and discharging a quantity of water from the mouth, expire. Their usual progress in travelling depends on the assigned stations, which vary according to local circumstances, mostly dependent upon the presence of water; they are in general from sixteen to twenty four miles distant from each other, and the enormous weight of one thousand and twelve hundred pounds imposed, is not what is actually carried on the road, but generally superadded before they enter towns or places where duties are levied by the load, which causes the drivers to pack the burdens of three upon two camels until they have passed the custom-house, the light camels paying none. But for speed, and on urgent occasions of danger, the Arabs of the desert will go fifty miles and more in twenty-four hours, with their loaded household camels; and the variety of the true Dromedary, or Mahairy, carrying only a single man, moves with wonderful rapidity, leaving a caravan, to reconnoitre in the desert as far as the eye can reach, and returning in an incredibly short space of time; these will traverse for several successive days spaces from seventy to one hundred miles in the twenty-four hours*. The

* It is somewhere asserted that a Bedouin carried a letter upon a Mahairy in four days from Cairo to Mecca, a distance of at least six hundred miles. If the fact be true, it can only have been effected, we think, by the Arab having somewhere a relay.

genus is exclusively confined to the ancient continent of the world, and the two known species, possibly both originally Asiatic, have each a considerable variety of breeds or races, adapted to the different wants of climate or locality, for burden or speed, the result of long subjugation. Both appear by nature to be clothed in a warm fur, which becomes scantier only in those which reside in hot regions, and this circumstance seems to be a fair indication that their primitive *habitat* was in a region occasionally cold; perhaps the southern foot of the Caucasan Mountains was assigned to what we now name the Arabian species, and the arid plains beneath the northern confines of the Paropamisaden range, the wildernesses of Gaznak and Chorasmia, east of the Caspian Sea, to the Bactrian; at least some inferences to that effect may be drawn from scattered hints in the Zend, the poems of Schah named Ferdusi, and in the Arabian epic composition Antar, which dates at least as early as the Hegira. In colour the several breeds differ, from a deep brown, which appears the primitive, to fawn colour and white; at this day, those residing towards the north are thickly clothed in autumn and winter with two kinds of hair; one fine, woolly and frizzled, the other long and straight; both are well known ingredients in manufactures by the names of Mohair and Camlets. In the spring, immediately after the rutting season they become partially or entirely naked, from whence we would induce a further confirmation of the above geographical position, as at that period the latitudes indicated are already sufficiently warm.

The frizzled hair is almost entirely replaced in the South by a shorter, scantier fur; and the long, less rigid, is confined to the fore part of the neck, throat, shoulders, and hunches. From the period of heat in the animals, which occurs early in the spring, the males, who are then what is termed *must*, are observed to abstain in a great measure

from food; they waste in strength, discharge a fetid humour from the glandular orifices at the back of the head; their eyes appear inflamed; they foam at the mouth, and occasionally protrude the ensanguined bag already noticed; the hunches on the back waste by degrees till they collapse in the form of an empty bag, and they shew the singular propensity to discharge their urine upon their tail, drawn for that purpose close under the legs, and then to whisk it smartly over the back. Copulation is effected, by the male biting the female till she is compelled to lie down, or in other species to drop on the fore knees; at this period the male organs change their reversed position, and assume the direction common to most other animals. The females are gravid a twelvemonth, and produce only one at a time; the Calf is born with an incipient hunch, the eyes open, and without the callosities on the sternum and joints, which appear only as it increases in growth. It sucks a whole year, insensibly learning to browse; at the end of the second year puberty commences, but four years elapse before it is adult, and six or seven ere it reaches maturity. According to the treatment which camels endure, their longevity may extend to thirty-five or forty years, but in India they are considered old so early as their nineteenth.

Buffon and others imagined that the Bactrian and Arabian species were specifically the same, because, as stated by Olearius, they intermix and produce a prolific breed; but this opinion is not general; and M. F. Cuvier justly observes, that if the fact were true, it would not singly constitute sufficient proof of identity in the species; and although it must be admitted that, without the difference of the hunches, there are scarce sufficient characters to distinguish them, still it would be necessary, before the opinion of Buffon can be adopted, to shew the intermediate breed proceeding from the commixture of the two species.

Some inference of the state of their intelligence may

be drawn from their obstinacy on some occasions, and their impatient haste for vengeance on account of ill usage on others: he who has given offence is sure to incur their resentment the first opportunity; but having once gratified this feeling, all remembrance of the injury is past. From a knowledge of this fact, the camel-drivers, when they have cause to apprehend this vindictive trait in the animal, drop their clothes in his sight, and conceal themselves; the beast instantly rushes at them, tosses them about and tramples upon them; when his anger being satisfied, the driver re-appears, and the whole business is forgotten.

The *Bactrian Camel* (*Camelus Bactrianus*, Linn.) is readily distinguished by the two hunches, one on the shoulders, and the other on the croup: his height may be considered as superior to the Arabian, and the bulk of his body more considerable. The large breed of this species attains seven feet and a half from the top of the hunches to the ground; the legs are proportionably short and the body long; they have a considerable fleece or coat of hair, generally of a dark brown colour.' It forms a very large tuft, covering the whole crown of the head, and is likewise very abundant on the arm, and round the fore-knees, the throat and hunches. Their rutting season commences at the end of Autumn, and lasts nearly four months; at the end of which time their hunches are sunk into a mere skin: in the beginning of spring they cast their coats, and are naked nearly two months. This species is considered as originally extant in ancient Bactriana, the present Turkestan, and the country we before indicated, under its ancient and indigenous names; they have spread from thence over Tartary, Persia, Thibet, and China. It appears that it is this species noticed in the Antar, as "unknown among the Arabs of in Cahtan (*i. e.* Eastern Arabia), and only found in the dominions of Kosroe or Irak." If we take the Tartarian

name Tjuga as the original, the Persian Tjuter, and the Tue, Tua, Dui, Tego, Tymi, and Tœmestri of the other nations of Central and Eastern Asia, may be considered all as derived from the same root, and support the opinion, that the species with an indigenous name was not imported from the south. It is probably also the origin of the Chinese Tong; they having a breed, it would seem, of this species, so peculiarly fleet as to be named Tong Kyo Fo, or "camel with feet of the wind;" the Greeks of the Roman period seem to have designated this species by the name of Ditylus.

The *Arabian Camel*, (*Camelus Dromedarius*, Linn.) is the species with only one hunch, and of which the Dromedary, properly so called, is a breed: thus also the names of Ashary, (the Oosharee of Antar) Mahary Oont Egin, &c., designate breeds, among which the Mahairy, or Dromedary of the Greeks, is the most celebrated for speed. Nago designates the female at least among the Western Arabs of Morocco. In this species, the contraction of the abdomen close under the pelvis, is still more remarkable than in the preceding: the hunch is broader, placed more on the middle of the back, and lower; but the legs are more elevated and slender. It appears to be divided in a similarly great number of breeds or varieties, all, nevertheless, depending on the very trivial distinctions of colour, size, and form: in height they do not exceed seven feet: those of Turkey are the strongest and best suited for burden, those of Arabia and Barbary the lightest, and those of India, where there are breeds for both purposes constantly supplied by fresh importations from the north-west; yet probably inferior in their class to those more in the vicinity of their original climate. The rutting season commences in Spring, and lasts only two months, at the end of which they do not become so completely naked as the Bactrian. The females are usually preserved from labour, browsing

at liberty in a gravid state, or furnishing milk to their owners, who load them only when moving their women and children.

This species extends from the foot of Caucasus over Persia and Turkey, Arabia, Northern Africa, and India.

The brown, or Turkish variety, has long been used to draw water, by moving in a circle attached to a machine, at the Menagerie of the King's Garden at Paris; and at this work, M. F. Cuvier observes, it executes a more laborious task than two horses could perform, although its food is less; and he infers from this, that the variety in question might be introduced to advantage in the domestic economy of Central and Southern Europe, especially as experience has proved at that place, that their successful propagation in that latitude seems to demand little precaution or trouble.

The Lamas. (*Auchenia*, Illig.)

The *Auchenia* or *Lamas*, form a secondary group of camels peculiar to America: designated at first as a kind of sheep, they were long known in Europe; but from the particular reserve which characterized all the concerns of Spanish Colonies, their real history and genus was barely indicated, till the Abbé Beliardi furnished Buffon with details, which even more recent writers have not known how to appreciate. The Count and Linnæus admitted but two species, resting indeed upon individuals brought alive to Europe; but Molina, writing more from memory than documents immediately before him, led Shaw, Schreber, and others, to admit five. More recent observations have established three, and it is probable that the remaining are varieties, produced by climate and domestication.

Originally the Peruvian word Lama may have designated only one of the species, which by extension was subsequently applied to all: there is indeed so general a

resemblance in all of them, that, at this moment, the propriety of the application of the specific names to the individuals exhibited in England and France is, to say the least, very doubtful. To ourselves the confusion is very apparent, from the number of living specimens and stuffed skins we have had occasion to delineate and compare both in the New World and in Europe. In M. F. Cuvier's An. Lithog. a figure, given as of a male Lama, may be suspected to belong to Vigogna, or, if a Lama, of a breed scarce more than half the size of the larger species. In London another animal, exhibited as a Lama, was of the dimensions and breed of those which in America were specified as Guanacos. A white individual in the possession of Her Royal Highness the late Duchess of York, approaching in size the usual stature of the smaller Lama, but with a coarser hairy coat than is found in other animals of the genus, was perhaps the true Guanaco. The Lamas or Alpacas repeatedly exhibited in London since 1816 and 1817, varied in size, though similar in the distribution of the colours, but differed in several particulars from another figure in M. F. Cuvier's An. Lithog. The true appropriation of the names and distinction of the species is, therefore, a desideratum, which must be left to a competent naturalist in Peru.

The Lamas bear a general resemblance to Camels on a reduced scale, and without their heavy and stupid aspect: the deformity of hunches does not load their backs, and instead of a bent neck, they carry their heads nearly perpendicular; which, together with the long pointed and moveable ears, animated large eyes, and small noses, gives them that air of sprightliness and activity which they actually possess. The principal organic difference which distinguishes them from camels, consists in the conformation of the toes, which are not, as in the Camel, united by a common sole, and in being destitute of the additional apparatus

in the ventriculus for water: the dentition is nearly the same, excepting that they want the canines in the lower jaw.

Most species are readily tamed, and even capable of considerable attachment to their keepers: all are believed to have their types still in a state of freedom, mostly at considerable elevations along the flanks of the Southern Cordilleras; where they live gregariously, sometimes assembling in herds of considerable number. By the conformation of the toes, they are much more sure-footed than true camels could be in rocky places and among slippery ice and snow, where they shew a decision and a vivacity of action, not unlike deer. Although no apparent provision is made to enable them to live deprived of water, it is known that they drink seldom, and in some cases not at all. They are curious and timid, but not very shy; some have a feeble bleating, others it is said, a neighing voice. They void their urine like the Camel, and are inclined to dung in one place: the females have but two teats, and, consequently, they produce, in all probability, but one at a time: of the time of copulation, gestation, &c. nothing is yet known.

Before the conquest of Peru, they were the only beasts of burden employed by the natives; since that time the increase of horses, and the superior vigour and sagacity of mules, have diminished their importance and consequent numbers among men: still, however, many are used by the poorer inhabitants, in the difficult passes of the mountains. When overloaded they are apt to lie down, and refuse to rise, notwithstanding every method is tried by the drivers; yet the larger species will carry, as we have had occasion to witness, a full grown man, and trot or rather run with great swiftness for several miles. The weight usually imposed does not exceed one hundred and fifty pounds, which they convey from sixteen to twenty miles in a day, with

very few attendants, among precipices and over rocks with great steadiness.

As their flesh is edible, the hide useful, and wool a valuable article in manufacture, they are so profitable, that little doubt can arise that the procreation of breeds of these animals in New Holland, and even in the mountainous parts of Southern Europe, would be attended with valuable results in rural economy. In Spain, some endeavours of this kind have been made; but the apathy and want of perseverance which seems to extend over all the enterprises of that people have rendered them abortive. Several of the facts and opinions here adduced are due to a friend, who travelled by land from Valparaiso to Carthagena.

Beside the species which we shall describe, with some positive means of discriminating, authors have noticed the Chilihuque, Camelus Araucanus of Molina, and, perhaps, the Mormorus of Nieremberg. In size it is reported equal to the Lama, but in appearance resembling a ram, with pendulous ears, long neck and legs, and tail resembling that of a sheep, but shorter and varying in colour in different individuals. But as this animal is asserted to have been the species originally domesticated by the Caciques, and even to have drawn a sort of plough, the trifling differences which separate it from the Lama may be regarded as the result of a particular breed, more completely degraded by long domestication and severe labour.

The *Huemel* (*Equus Bisulus*, Mol.) is perhaps a real species of this genus, which from its neighing voice and some fancied resemblance in size and colour with the Ass, has been admitted without sufficient reflection in the catalogue of nomenclators, as a species of horse. It is described as wild, strong, and swift, and residing in the rocky regions of the Cordilleras of Chili, as far south as the Strait of Magellan.

The *Lama*. (*Camelus Glama*. Lin.) This species is

considered by Baron de Humboldt as entirely domesticated, the occasional wild animals being only strayed individuals. From this circumstance he infers that their specific characters are not easily marked with precision; because, in a domestic state, several breeds are reared, among which the original type is more or less disfigured. Among the individuals examined by us, the variations of size, colour, and conformation, were certainly evident, especially if the animals designated as Guanacos be considered as a mere variety of the true Lama. But as this question is subject to doubt it will be preferable to describe them for the present as a distinct species.

A Lama of the largest breed is about four feet four inches at the shoulder; above five feet from the breast to the tail, and from the ground to the top of the head nearly six feet. There are, however, breeds far inferior in stature, and the specimen described by M. F. Cuvier did not reach three feet in height at the shoulder. This individual was a male of a brown colour, the face white, with dark spotted nose and mouth, a spot before and one behind the eye extending to below the jaw. The throat was whitish and the neck gray. The joints of the fore-feet white. These animals, however, vary in colour and markings, but the prevailing tones are brown passing into vinous rusty dark brown, black, and even white. The hair is long, soft, elastic, and woolly on the neck, throat, body, rump, and tail; close and short on the head and limbs. The fine specimens exhibited in London in 1816 and 1817, were entirely white on the head, throat, neck, shoulders, and fore-legs; from the withers backwards of a deep purple brown; from the chin, down the neck and throat, fine soft hair, about nine inches long, hung down to below the knees in the form of an apron, with a beautiful silvery lustre. On the back, rump, sides, and tail, the fleece was more packed and woolly. The hind-legs were earthy

brown. One specimen, a male, was about four feet high; a female, considerably lower, had the same distribution of colours, with the addition of a dark spot on the lips, several smaller on the ears and on the fore-legs. They were considered as Alpacos, but their superior size, and the presence of callosities on the limbs, if this distinction be permanent, places them among the species of Lama. The male was accurately figured by Mr. Agasse, and the female, which was shewn afterwards by Mr. Howitt *.

The head of the Lama is thick in proportion to the length, the lips tumid, the ears rather rounded at the tips, and the forehead covered with short close hair. The legs are stout, the back straight or slightly hollow (perhaps from early imposition of burdens). The diameter of the ham, from the hip to the tail, rather broad, and his feet spread. His manners are gentle and confident, and shewing but little vivacity; but his carriage is graceful, and seen in front, with the splendid white clothing of the throat and breast, beautiful. These observations on the proportions of the animal are, however, relative, and should be borne in mind when compared with other individuals exhibited as the Guanaco.

The *Guanaco (Camelus Huanacus.* Gmel.) Without as-

* This figure is engraved in the work, and by mistake named Alpaco, because the specimens were exhibited as such. On comparing the figures of Gesner and Schreber, it is evidently the same animal which they have represented as the Guanaco, and we have here a striking example of the confusion which reigns on this subject. If the animals here given be not Lamas, but Guanacos, it follows that those described here as Guanacos must be another species or strongly-marked variety, not so much of Lama as perhaps of Chilihuque, or a species as yet unknown. The hair ascribed to my lamas is a mere different state of their fleece. Gesner representing his at the renovation of it, and mine at its greatest length, taking Gesner's Allocamelus as represented in Shaw's Zoology.

suming that the animals shewn under this name were the real Guanaco, or that, if such, they form a distinct species, their form and character is sufficiently different to render a separate description most advisable. The specimens exhibited in America and London were in height something more than four feet; and their necks being proportionably longer than the Lamas, the top of their heads was about six feet from the ground. The head was longer and the nose and lips much smaller and more delicate than in the former animal; the ears longer, more moveable and pointed; the forehead covered with a sort of brush of standing woolly hair. The back was arched, and the tail carried erect or even reversed up onthe back; the abdomen, drawn up high under the pelvis, gave an air of weakness to that part; the diameter of the rump shorter, and the limbs finer and more elegantly formed than in the preceding. In attitude, the head was carried upon a neck perfectly vertical, shewing an inaptitude to look round or on either side; for when this was required, the whole animal turned. The individual more particularly observed shewed attachment to his keeper; he was jealous, would lay the ears back, stamp with the fore, kick with the hind feet, spit, or rather squirt saliva at those who gave him umbrage, or who gave potatoes or apples to other animals in his presence. He would occasionally carry his keeper, and run for a couple of miles with such velocity as to distance horses at a round trot. His head was white, with a rusty spot on the nose and some gray about the cheeks; the neck, covered with a short wool, was buff in front, whitish on the sides, and gray behind. The breast and shoulders were covered with loose and soft white hair; the back, hinder shoulder, sides, and rump with shortish woolly hairs of a dried rose-leaf colour; the legs, sternum, belly, and region around the anus, dun; the tail, black above, was edged with longish white hair, and naked below. The callosities on the limbs

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THE LAMA.

C. GLAMA. Lin.

London Published by G. & W. B. Whittaker, Sept. 1820.

were small, on the legs scarcely perceptible, the toe-nails very small.

Although the aggregate of distinctions produce a figure very different in aspect from the Lama before described, and from another individual similar to this, excepting that the colours were more buff and dun (which was shewn in London, and is figured under the name of Lama in the work), there is still no prominent character by which they might be positively separated, and we have to adduce one more, which, perhaps, may be the true Guanaco of authors, and yet it assimilates in some particulars most with the Lama.

This individual was kept at Oatland, and was the property of Her Royal Highness the late Duchess of York. It was not above three feet at the shoulder, the back was slightly arched, and the tail carried close; the ears were long and round at the tips; its colour wholly white, with black spots on head, neck, limbs, and belly, and larger, paler spots on the sides and back; the texture of the hair was coarser, short on the head, neck, and legs, and longer on the other parts.

It may be that the specimens here noticed are the Lama, either in an unreclaimed state, or at least not so completely altered by domestication as those before described, and that it is to these authors refer, when they represent them as descending from the high Andes on the approach of the winter months, to the middle regions, moving boldly, and bounding with the vigour and swiftness of the Stag. They add that the young are hunted with dogs and the Lazzo; but that the elder must be shot; their venison, when young, being of superior quality; but when old, that it is then either salted or jerked.

The *Paco*. (*C. Paco*. Fred. Cuv.) The Paco, or Alpaca, was first clearly described by M. Frederick Cuvier in his *Mam. Lithog.* 1821. His specimen, kept in the gardens of

the Menagerie at Paris, measured three feet two inches and a half at the shoulder, four feet three and an half to the summit of the head, and three feet nine from the breast to the tail. It was a female, extremely gentle, but timid. It would blow and spit at strangers, move in a canter, deposite its dung in one spot always as far as possible from the stable, and bleat like a young lamb. The positive character by which it was clearly distinguishable was the total absence of all callosities on the sternum and limbs. The colour of the neck, back, flanks, and breast, was fulvous-brown, tail brown, head mostly gray, darker on the nose, and rusty behind the ears, where there was a white spot. The legs and feet were dark; inside of the thighs white; from the nape of the neck all over the body and tail the hair was long, soft, and woolly, of a delicacy and elasticity approaching that of the Angora Goat, and so abundant as to give the figure of the animal a clumsy appearance. The able naturalist above quoted observes with great judgment upon the advantages that might be derived from the introduction of this species in our domestic establishments, both as an article of food and a manufacturing object.

The *Vicunna*. (*Camelus Vicugna*, Lin.) This animal was originally described by Count de Buffon, *Suppl.* vi. p. 215: this species most celebrated of all the genus, for the fineness of the wool it affords the manufacturer, inhabits the highest points of the Southern Andes. In size, it is much below the others, not measuring more than two feet eight inches at the shoulder; light of form, short body, with a long straight neck, elevated croup, and in general shaped like the former, excepting that the eyes in proportion are very large, dark, and prominent, and the face and nose small and rounded. It exhibits great liveliness and even vehemence of character, but is easily intimidated, even to stupor.

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A specimen which fell under our observation in South America was of the above dimensions. On the back and sides it was of a reddish-brown, or dried rose leaf colour; the breast, belly, inside of the thighs, cheeks, and outer surface of the ears, and under part of the tail, were white, interspersed with buff; the limbs were dun. It refused water, was petulant, and would offer to bite; seemed to bear the heat of a tropical sea-shore with uneasiness, and preferred sweet potatoes to other vegetables, although from the natural abode of the species, Lichens must be its usual food.

The fleece of these animals, well known in commerce, is an object of importance in South America; but then ative Indians and the settlers in the country, alike indolent and improvident, prefer the destruction of the animals in the chase, to the more profitable and lasting advantage of rearing them in flocks. It is however to be expected, that the political changes which South America has undergone, may introduce a more rational and a more enlightened practice. The mode hitherto adopted to obtain them, it is said, was by stretching ropes, to which bunches of feathers were attached, across the passes of the valleys below their abodes, and driving them down in the required direction, till they came upon these objects, when (similar to the Fallow-deer of Europe) the herd would stop in terror at the fluttering of the feathers, and wait to be slain or noosed by the Lazzo, or even taken by the hand, unless an Alpaco were among them, who, not intimidated by this contrivance, would leap over, and then the whole would instantly follow its example.

The Musks. (*Moschus*, Lin.)

The animals included in this genus assimilate in so many particulars with the Deer, that they have been classed with propriety in the same family, succeeding in the first place the ruminants of the Cameline group, because they are,

like them, destitute of horns; and preceding the Stags, whose horns are deciduous. They are externally distinguished from all other known ruminants, by this deficiency of horns, but they have, in common with the Stag, two pointed and edged incisors or canines in the upper jaw of the males, which extend in some species outside of the mouth. Internally, they have a peroneum, which is wanting in other ruminants. The eyes have no distinctive character, are destitute of a lachrymary sinus, and the nostrils are divided by a small muzzle, as in the Stag; the ears are either short or pointed, the tail short, and the females have two or four teats.

Their fore-quarters are lower than the hind, and with some exception in the Tibetan Musk, their attitude is low and crouching, bearing the body, which is heavy and clumsy in proportion to the delicacy of the legs, low, and the head straight forward. It is probable, that in manners, they resemble the small forest Antelopes, being, like them, shy and solitary, inhabiting rocky woods. In a domestic state, the individuals which have come under our notice, were lively, ran about with agility, shewed little instinct or attachment, but were gentle, and uttered occasionally a weak sort of guttural grunt, without apparent motive. They were fond of hiding in corners, lying down often, and shewed a slight indication of callosity on the sternum and knees.

All the Musks are probably natives of Asia and the great Islands of the Indian Ocean. Seba and Shaw have figured several small animals, supposed to belong to this genus, but among them, those of South America are in all likelihood fawns of some sort of deer, and those of Africa, females of the Gueveis or Royal Antelopes, which, with a similar stature, form not a single species, but a small group.

The *Thibetan Musk* (*Moschus Moschiferus*, Lin.), was

unknown to the ancients, and although the drug which this animal bears, was employed from time immemorial in central Asia, and subsequently in Europe, no notice of the species to which it belongs existed, till Abuzeid Serassi, an Arabian author, described it as a deer with horns. Serapion, who flourished in the eighth century, according to Shaw, was the first who introduced a knowledge of the animal into western Europe. Avicenna, Gesner, Aldrovandus, Kircher and Boym followed; but Grew gave the first satisfactory description. At length Buffon collected the scattered notices of authors, and having obtained a living specimen, his and Daubenton's descriptions, united with Pallas and Gmelin's, determined its locality in the general system of organized beings.

The animal is nearly the size of a roebuck, with a head similarly shaped, excepting that the upper lips are broader, owing to the two canines which hang out on each side of the mouth, and that behind, at the angle of the gape, are two tufts of hair. The texture of the hair is coarse, nearly all white at the base, but ending in brown, dun or black tips, which produces a different shade of colour, according as the creature is seen in front or flank. The lips, chin, breast, belly, and inside of the limbs, are white; the iris rusty brown; the hoofs long and pointed; and the succentorial very long, serving the animal to grasp the edges of rocks, in climbing or descending in the same manner as the Chamois; the hind quarters are more elevated than the anterior: hence their movements are rather in a canter than a trot, and their habitat requires vigorous leaping, in moving from the barren or snowy regions to the pine zones of the Alpine tracts of central Asia, where they reside; their native region extending from China and Tartary, to the mountains above the sources of the Indus, and north, to near Lake Baical. The province most renowned for the superior quality of the musk of its animals, is Thibet.

The flesh is esteemed, notwithstanding its strong flavour of musk; but the pursuit of the animal is principally for the scented substance generated in the musk-bag, situate on the abdomen before the prepuce of the male, and two or three inches in diameter. The hunting period is chiefly in the rutting season, because at this time the secretion is most abundant, and of the highest quality. When the animal is slain, the bag is cut away and made up into a kind of purse; but from the prodigious quantity sold, it is evident that great falsification of the substance must take place; and indeed it is asserted, that the blood and liver chopped small, and even lead, are mixed with the true musk. Tavernier relates that he bought at one time thirteen hundred and seventy-three bags.

The time of gestation, and other circumstances of the progeniture of these animals, is not as yet perfectly known. They are said to feed principally on roots, for which they dig and cut with great facility with the edges of their canines; and it is probable that the tufts of hairs at the corner of the mouth, are to guard the under jaw from injury during this operation.

In comparing the descriptions and accounts of friends who have observed them in their native regions, and in India, it would appear that there are two species, differing in stature and in colour. The larger are said to be brown, with longer and more pointed ears, and the canines about three inches long; the smaller, of a slate colour, with broader ears, and some black on the throat. It is probable, however, that these are only varieties of climate or breed, and, perhaps, of sex or age.

The *Pigmy Musk* (*Moschus Pygmeus*, Lin.), admitted in the catalogues upon the faith of the Plate 43 in Seba, is considered very properly by M. F. Cuvier, as a very doubtful species. He justly observes, that the specimen described by Buffon is only a young animal, a fawn. Our own re-

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THE PYGMY MUSK OF SUMATRA.

M. PYGMÆUS L.

Griffith &
Elgr Exotic Mamm 1821.

London Published 1st by G. Whittaker May 1826.

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THE MEMINA OR INDIAN MUSK. *Of Pennant.*

MOSCHUS MEMINA. Erxleb.

Published by C.B.Whittaker Sept. 1826.

searches have produced several drawings from different museums, at first, without being aware that there was a doubt. On comparing these with Seba's figure and Shaw's, we are inclined to consider them all as the young or the female of Ant. Pygmea, for the absence of the succentorial hoofs, is in this case no criterion. As the question now stands, this species may be omitted; although M. Desmarest states that they have tusks or canines, but upon what authority, we do not know.

The *Memima*. (*M. Memina*, Pen. Schreber.) First noticed by Knox, in his account of Ceylon. It is in length about seventeen inches; in colour, of a cinereous olive, with the throat, breast, and belly white, and the neck, sides, and rump streaked in long bars of the same colour. The ears are rather large and open, and the tail very short. We have seen two individuals of this species alive, but they were in so languid a state, as to leave but little room for remark. This animal is not without beauty, resembling the Java and Napu Musks in gait and manners, and belonging, we believe, exclusively to Ceylon, where it resides in the Jungle.

The *Java Musks* appear to constitute a small family, or, perhaps, only varieties of one species. Pallas and Buffon first noticed them, but Sir T. S. Raffles has lately (vol. xiii. *Lin. Trans.*) given a detailed account of them, as also M. Fred. Cuvier, from whose united descriptions we shall endeavour to extract our notice, with such remarks as we have made on a living specimen.

The *Napu*, Raffles (*M. Napu*, F. Cuvier), is the largest, being about twenty inches long, by thirteen in height. It stands considerably higher behind than at the shoulder. It is of a mottled ferruginous colour on the back, gray varied with white on the sides, and white below and on the inside of the thighs; tail from two to three inches long, tufted, white below and at the end. A white stripe runs along the

base of the lower jaw on both sides of the posterior angle: the space between is also white and gives origin to three white stripes, which run to the shoulders and middle of the breast, forming thus five white divided by four black lines. The top of the head is flat and of the same colour as the back, which, however, becomes darker on the ridge of the neck; a line of naked purplish black skin runs from the eyes to the nose, and a gray stripe some way along the belly. It has short spurious hoofs. Its physiognomy is very like that of the Agouti; but the comparative bulk of body, contrasted with the extreme delicacy of the limbs, is very remarkable, and forbids powerful efforts in leaping: it sits often gathered up like a ball, and walks rather heavily. The females have four teats which seem by their proximity to form one udder.

This species frequents the thickets near the sea-shore, and feeds principally on the berries of a species of Ardisia; it is easily tamed when taken young. M. F. Cuvier objects, perhaps with reason, to the trivial name of Javanicus, which Sir T. S. Raffles affixes to it, and considers it as a new species. An individual which we saw at Baltimore, likewise distinguished by five white stripes, was somewhat smaller and probably younger: the colour was brown, and it ran about with great activity, although, from long confinement, the four joints of the limbs were considerably swelled. There was also not that evident disproportion in the bulk of the body, compared with the legs, and the spurious hoofs were more visible.

The Kanchil. (*Moschus Jasanicus*, Pallas and Pent.) This species is smaller, being about fifteen inches long, by nine or ten in height. In form it nearly resembles the Napu, but is lighter and more active. Its colour is very different, being of a deep red-brown, approaching to black on the back, and becoming of a bright bay on the sides, white on the belly, and inside of the legs. It has three white stripes

on the breast like the Napu, but differently disposed. The shape on each side of the lower jaw is prolonged to the shoulder, narrowing as it recedes: the middle stripe is broadest below, and narrows to a point above, never uniting with the lateral stripes. In the Napu, on the contrary, the three white stripes originate from one point, between the maxillary ones, which appears like the commencement of another pair, and all three become broader behind. The head of the Kanchil is not so flat, and the muzzle is more curved above; the black lines from the eyes are wanting, but a well-defined black line runs down the back of the neck, which is not found in the Napu. A brown line passes from between the fore-legs to the middle of the belly. This species is further distinguished by having long upper canines, curving backward, while in the Napu they are short and straight; the tail is from one and a half to two inches long, tufted, white below and at the end. It has spurious hoofs like the former.

These differences are constant at every age, and they differ no less in manners. The species lives in the depths of the forests, and feeds chiefly on the fruit of the Kayo-briong (Gmellinia villosa, Roxv. 6.); it will live in confinement, but never becomes tame, endeavouring perseveringly at an escape to the woods. It is a swifter and lighter animal, and is proverbially cunning. It is related, that when taken in nooses laid for them, they will, when the hunter arrives, stretch themselves motionless, as if dead; and if he unties them without further precaution, they will seize the moment to start upon their legs and disappear in an instant. A still more singular expedient, however, is mentioned, that when closely pursued by dogs, the Kanchil will sometimes make a bound upwards, hook itself on a branch of a tree, by means of its crooked tusks, and there remain suspended till the dogs have passed beneath.

No portion of this activity and quickness is ascribed to

the Napu or Pelandok, and to this difference of disposition is attributed; the Kanchil frequenting the forests without fear of the Tigers and beasts of prey, while the former two seek safety in the thickets nearer human habitations, where they are less exposed to such enemies.

The *Pelandok* (*Moschus Pelandoc*) is noticed by Sir T. S. Raffles, as the least of the three in point of height, with proportionably a larger and heavier body, and a larger eye. By this description it may be presumed that the Napu, as figured by M. Frederic Cuvier, is in reality this species, and that our specimen is the true Napu; but none of all these notices are completely applicable to a specimen formerly in the Leverian Museum, of which we have a drawing, and which Dr. Shaw figured in the first volume of the *Naturalist's Miscellany*, p. 3. It was in all respects a musk of the Javan group, in colour of a light ferruginous gray, naked round the eyes, but without the streak to the nose. The canines were scarcely visible, and the three white streaks commencing at the union of the white lines running under the maxillæ, branched from thence, one to each shoulder, and the third to the breast, but all united at their common centre, and without the intervention of dark colours. Hence it would appear that these animals vary in the form of colours of the subjugal stripes, that sometimes the two maxillary ones have been overlooked, and, consequently, that the perfect discrimination of species is not as yet satisfactorily established*.

The Deer. (*Cervus*, Lin.)

M. Frederic Cuvier has given a general view of the animals of this genus, in the *Dictionnaire des Sciences Naturelles*, article *Cerf*. From this excellent source we

* The figure in this work under the name of Pigmy Musk of Sumatra, taken from the life at Exeter 'Change, offers a further proof that the species and varieties are not as yet clearly ascertained.

shall draw our principal observations, and add such remarks from other quarters, or from personal research, as may increase our knowledge on this subject. The word Deer is derived from a Teutonic root, or the Greek Θήρ, variously pronounced and written, at different times and by different nations. Dier, Thier, Thur, Anglo-Saxon Deor, designating in general an animal, afterwards confined more especially to ruminants; in the English and German to Cervine; and in some of the Sclavonic dialects to the ancient Urus, or the Wild Ox. The genus, comprehended under this denomination, consists of those animals, the males of which have deciduous horns or antlers, destitute of a horny sheath. In general they are remarkable for the elegance of their forms, the lightness of their proportions, and the velocity of their movements. The legs are slender and firm, the body round and compact, the neck long, and the head well shaped. Their look is meek, yet confident, wild, yet curious; the colours of their coat, clean, brilliant, and agreeable. Hence, Deer have been at all times interesting to mankind, and the chase of them the object of the great and wealthy.

The genus is extended over Europe, Asia, and America; it is found in Northern Africa, and in most of the great islands of the Indian Ocean. The Portuguese introduced Deer in the Isle of France, and the British in Jamaica, and the latter, doubtless, soon will import them into New Holland. We have already given some general notions of the characters which are common to all the ruminants, and need therefore only refer to those distinctions which separate them from the other genera. The most remarkable of these are the horns; that is, those osseous productions of the forehead which fall and are reproduced successively, and which, with the exception of the Rein-deer, are the exclusive property of the males. The common opinion, however, of the annual shedding of the horns in the Deer, must be re-

stricted, in all probability, to those species which reside in cold and temperate regions, or who have these productions of a large size. It is the opinion of Sir T. S. Raffles that the Muntjaks of the Indian Archipelago never, or at least but seldom, renew theirs; and our own researches within the tropics of America tend to confirm it, so far as relates to that class of them who have only single spikes, and branched antlers.

Animals offer few phenomena more inexplicable than that species of vegetative spontaneous production, of which the germ is invisible, and which, nevertheless, is subordinate to fixed and precise laws. At a given age the horns of the deer-kind begin to develope; at first a slight protuberance appears, covered by the skin, where a great number of vessels are spread, for a considerable degree of heat is perceptible under it. Soon the protuberance rises, and in some species branches off into ramifications; after a certain period the development is arrested, the skin which had continued to stretch and extend over the whole production, loses its heat, dies, becomes dry, and finishes by tearing off in rags; at length the horn itself becomes detached and falls; a slight hemorrhage follows from the skin or the part of the frontal which sustained it. After twenty-four hours in healthy Deer, the vessels which emitted the blood are closed, a thin pellicle covers the wound, and immediately the reproduction of a new horn becomes apparent; the extremity of the vessels swells, a burr expands around the base where the late horn stood, resembling those on the bark of trees, when they have received wounds which begin to cicatrize: the burr widens, while the vessels which proceed from the bone depose osseous matter. Hitherto the development of the horn has been uniform, the vessels have extended in a certain direction, always the same in each species; but when they have arrived at a certain point, they separate, some continuing as before,

while others turn into new, but always invariable directions, if no accident impedes them. These last, which have formed an *antler* or *snag*, soon stop, but the former continue increasing the beam, throwing off from time to time others, again to form branches, till at length the species of bony vegetation ceases also; the skin or velvet which covers them dries again, and the horn falls, to be replaced by another.

We know nothing of the origin of that power which directs certain vessels of the head to develop themselves constantly into divers but positive directions, and to produce the forms extremely varied in the horns of the deer kind. It is a branch of the science, covered with obscurity, deserving the attention of observers, and promising interesting results. The shedding of them, on the contrary, is explained in a plausible manner; at a certain period of their growth, the basal part of the beam becomes so hardened, that the vessels which pass through them, finish by being compressed and finally obliterated, causing the osseous substance to become insensible, and, like a strange body, to separate from the rest of the organized parts which are still vivacious, thus referring the operation to the principles of exfoliation; but what increases the singularity of the development of antlers in the Deer, is the invariability of the forms, and the constancy of the laws to which this development is subjected. Under similar circumstances the horns of two deer of the same species are of similar form, and the influence of the causes which can modify it, becomes observable most towards the extremities; hence the basal part offers to zoologists one of the most positive specific characters, although the antlers are, perhaps, of all the organs of animals, the most subservient to artificial influence. Thus a stag scantily fed, will carry small and slender horns, without therefore being deformed; if he be in ill health, the horns are likely to become mon-

strous, either from an excess or a deficiency of the substance which composes them. Castration will arrest their expansion, and dry up the source which gave them existence; a wound will give another direction to the vessels, and in this manner produce branches where none would appear otherwise. If in this case one horn becomes monstrous from excess, the other will be so from a defect of substance: to conclude, advanced age has also its influence, the horns then become small, slender, and, finally, irregular.

The flattened or palmated shape of the horns in several species, seems to be a provision of nature to enable the animals to clear the snow off their food, for it is remarkable that this structure is confined to those of the higher latitudes, and rendered applicable in proportion as they inhabit more rigorous climates. Thus, in the Rein-deer, who are absolutely arctic, it is most so, and least in the Fallow-deer, who belong to the colder temperate regions. This form is to be traced even in some of the Antilopinæ of America, Dicranocerus Palmatus, who resides the furthest north, bearing horns much broader than the next species D. Furcifer. The Caribous of America, who have to contend still more with deep snow than the Rein-deer of the old continent, have their horns broader and better adapted to that purpose; besides, both varieties, in addition to these natural shovels, have broad feet, not only to sustain them the better on snow, but also to clear it away. Thus these arctic inhabitants are provided with a double organization for this purpose, while others less northerly ruminants have only one provision; as the horns of the Elk, or the feet of Ovibos and Aplocerus Lanigerus; these, besides, migrate to latitudes of a milder character. The horns of the Rein-deer, indeed, drop in winter, but this takes place only at a period when the snow is already not only very deep, but frozen hard, and even then we see, that the females, when gravid, and therefore in want of a greater

supply of food, preserve theirs till May. Hence it may be taken as a maxim, that all the horns of a palmated shape belong to species of high latitudes, and that those of this class, which we shall notice under the head of *Cervus Mexicanus*, are, in reality, of animals of cold climates; nay, more, as we know South America to abound in Deer, that we may look for representatives of the Elk and Rein in the high latitudes of Patagonia.

The hair of some species of this genus, presents a character visible also in several antelopes and other ruminants; namely that of being fragile, unlike that of carnivora and rodentia. which is elastic; they have in general but one sort, the woolly being in small quantity excepting in the Rein. In summer the most predominant colours are lively, in winter darker; the general livery of the Deer may be considered as of various tones of brown marked with white spots; this livery is permanent during life in several species, still more general in the Fawns of others, but there are, notwithstanding, others who never bear this distinction. Albinism is not uncommon in the Stag and Fallow-deer. Within the tropics the colours of the resident species never alter, not even when those species are brought to and multiplied in Europe. In some, the males have canines; in the Muntjaks they become as long as in the Musk. We have seen one who had them double. The pupil of the eye is a lengthened oval; the feet are perfectly cloven; the ears are large, and hearing very acute; the tongue is smooth and long; and the nose in most species terminates in a muzzle. Their sense of smelling is delicate; also in the choice of food they are select, applying the nostrils and occasionally the opening of the suborbital sinus; which seems to communicate in some with the olfactory apparatus. This sinus is not found in all, some having only a fold of the skin or even none; in others it forms a sack, which, according to Mr. White in his Natural History of Selbourne, when speaking of the

Fallow-deer, can communicate with the nose, and, consequently, that they can drink with the nose deeply immersed, without drawing the head out of the water to breathe. This statement has been called in question; but we have witnessed it in the Great Stag or *C. Hippelaphus* at Mr. Cross's Menagerie, and the air passing out of the suborbital sinus, while the animal drank, could be felt by the hand, and even affected a candle.

The voice of the genus in general, is a disagreable kind of braying. The females have four teats and produce one or two fawns at a time. In temperate regions this takes place in the spring, because the rutting season is in autumn; but in warm regions, where no winter is felt, the regulating seasons seem to be the monsoons, and the rains produced by the passage of the sun to either tropic.

In Deer the intellectual instinct is far from contemptible; in this respect the chase of the Stag is very curious. On those species which live more or less isolated, a certain degree of domesticity may be imposed; but the gregarious, such as the Rein-deer, may be reclaimed altogether; which is a proof in support of the opinion, that gregarious animals alone can be completely domesticated. Some species reside exclusively in forests, others in the open plains or even in swampy meadows.

An artificial arrangement of the species in whatever way it is distributed, is liable to objection; there are, however, several subordinate groups, distinguishable as well by similarity of structure as by the additional advantage of geographical unity, but we must except from the latter particularity those of the higher latitudes, who in common with other animals inhabit certain zones rather than countries.

The Alpine Group.

The *Elk*. (*Cervus Alces*. Lin.) Moose of America. This animal is the largest of this genus, being higher at the shoulders than the Horse, its horns weigh sometimes

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THE AMERICAN BLACK ELK.

London. Published [illegible] B. Whittaker. May. 1824.

near fifty pounds; accordingly, to bear this heavy weight, its neck is short and strong, taking away much of the elegance of proportion, so generally predominant in the Deer; but when it is asserted that the Elk wants beauty or majesty, the opinion can be entertained by those only who have seen the female, the young, or the mere stuffed specimen: for us who have had the opportunity of viewing the animal in all the glory of his full-grown horns, amid the scenery of his own wilderness, no animal could appear more majestic or more imposing. It is, however, the aggregate of his appearance which produces this effect; for when the proportions of its structure are considered in detail, they certainly will seem destitute of that harmony of parts, which in the imagination produces the feeling of beauty. The head measuring above two feet in length, is narrow and clumsily shaped by the swelling upon the upper part of the nose and nostrils; the eye is proportionably small and sunk; the ears long, hairy, and asinine; the neck and withers are surmounted by a heavy mane, and the throat furnished with long coarse hair, and in younger specimens encumbered with a pendulous gland: these give altogether an uncouth character to this part of the animal. Its body, however, is round, compact, and short; the tail not more than four inches long, and the legs, though very long are remarkable clean and firm: this length of limbs, and the overhanging lips, have caused the ancients to fancy, that it grazed walking backwards. The hair of the animal is coarse and angular, breaking if bent.

The Elk is an inhabitant of northern latitudes; in Europe between the fifty-third and sixty-fifth degrees: making a part of Prussia, Poland, Sweden, Norway, Finland, Lapland, and Russia. In Asia it is found further south, from thirty-five to beyond the fiftieth, spreading over Tartary, and abounding in Japan, if indeed the denomination of Elk is not misstated for that of a Rusa, or an undescribed

species. In America, it resides between the forty-fourth and fifty-third degree, round the Great Lakes and over the whole of Canada and New Brunswick.

Its movements are rather heavy, and the shoulders being higher than the croup, it does not gallop, but shuffles or ambles along, its joints cracking at every step, with a sound heard to some distance*. Increasing its speed, the hind feet straddle to avoid treading on its fore-heels, tossing the head and shoulders like a horse, about to break from a trot to a gallop. It does not leap, but steps without effort over a fallen tree, a gate, or a split fence. During its progress it holds the nose up, so as to lay the horns horizontally back. This attitude prevents its seeing the ground distinctly, and as the weight is carried very high upon his elevated legs, it is said sometimes to trip by treading on its fore-heels, or otherwise, and occasionally to give itself a heavy fall. It is probably owing to this occurrence, that the Elk was believed by the ancients and the vulgar, to have frequent attacks of epilepsy, and to be obliged to smell its hoof before it could recover; hence the Teutonic name of Elend, (miserable†,) and the reputation, especially of the fore-hoofs, as a specific against the disease.

During the winter months the Elk resides chiefly in hilly woods; in snowy weather seeking the covers, and in clear the open spaces. In summer, it frequents swamps or the borders of lakes, often going deep into the water to escape the sting of gnats, &c., and to feed without stooping. Its

* This sound is supposed to arise from the snapping of the points of the hoofs against each other; but in a letter to Buffon on the similar sounds in the feet of the Rein-deer, it is asserted to take place even when the animal does not lift his feet, but turns or leans merely, more on one side than the other, and, therefore, that it lies in the joints.

† Another Teutonic name Elch (Elk) or Eilch is supposed to derive from *Heil*, to heal, to be whole, and thus the Teutonic would be the root of the Latin *Alce*, and perhaps the Greek *Elaphos*.

usual food in winter consists of the buds and bark of button-wood, spruce, and juniper pines, birch and maple, and under the snow it seeks stink wood (*anagyris fœtida*,) and mosses; but this is always with difficulty, for then it is obliged to spread the fore-legs, or even it is said, to kneel. The branches of trees it turns down with the horns very dexterously; but to get at the ground, we have been assured by Huron and the Canadian hunters, when the snow has fallen only to a foot or two in depth, that the herd, led by an old male, shovel it back, and throw it over their heads; the snow falling on either side, as it slides from the inclined planes of the back of their horns: meantime the fore-feet of all are equally engaged in striking it from under them.

During a part of the year, the herd consists of an old female, two adult females, two young females, and two young males; but during the snowy periods, at least in America, one or more adult males are certainly among them, very old males alone keeping aloof, until the rutting season, unless the winter be very severe. Several of these families keep near each other, and in very cold weather they seek cover together, and remain closely pressed against one another, or trot in a circle, till they have beaten the snow down. When the rutting period commences, which is about the beginning of September, the old males seek the females, and expel the young, who are obliged to keep aloof while the animals remain in heat. At this time they will swim rivers in pursuit of the females, or after them to remain concealed in some of the Lake Islands. The males are then very pugnacious; they bellow often, and sink in flesh. The gravid females bring forth about the middle of May, at first one, but ordinarily two calves, of a brown-red colour. These are so simple and void of fear, that in the first months they are easily taken, and if in the water, where they willingly go to avoid the flies, they will suffer persons

in a canoe to come up to them and take them by the head, without appearing in the least frightened.

The dags, prickets, or incipient antlers, are the first year not more than an inch in length; the second they rise to a foot; the third they are forked, and the fourth they first assume six snags, and are somewhat flattened; the fifth year, the blade is still small, but their expansion from that time forward, is uniform; though it does not appear that the number of snags ever exceed twenty-eight. In a very large specimen which we saw shot, there were twenty-two, the length from the head to the tip, twenty-seven inches, and from tip to tip across the horns, three feet six: the two lower snags on each side separated by a deep indenture; the weight about thirty-three pounds. Old elks shed their horns in January and February, and if lean from a severe winter, in March; the younger later, till the month of May. They are again completely restored in the former by the end of June, and in the latter in August.

An elk killed in Sweden, is said to have weighed twelve hundred pounds; but this must have been a very extraordinary animal: their height is about six feet. A white specimen from Swedish Lapland, in the Munich Museum, five years old, is six Rhineland feet at the shoulder. A female, figured by Mr. Heriot, was seventeen hands high: the large male above alluded to, was scarce four inches more, or about six feet; but he was very deep at the shoulders. Another, whose antlers were still more deeply indented at the base, that is with the parts corresponding to the brow and bezantlers of the Stag, separated from the main blade by a deep intersection, was not more than seventeen hands and a half high. His head measured from the nose to between the ears, two feet three inches; distance between the eyes eight inches; length of the ears nine inches and a half; the lower branches or snags were bifurcated and thirteen inches long, and their united amount was

seventeen, with the rudiment of an eighteenth. The hunters named him a black Moose, and from the greater length of head in proportion to his height, and the particular form of the horns, insisted that this was a different species from the brown. There is, however, no character sufficiently distinctive to claim our assent to this assertion, for it is known that considerable variation in the horns occurs from various causes, although it must be admitted that the almost complete separation of the lower parts into the form of branches, is a very prominent character in most if not all the American specimens, while a similar formation is rare in those of Europe: but the colours of the hair differ with the season; and if this specimen belong to a different species, both would be of that species, the result proving only that the European is not of the same. The two here mentioned were dark, almost black, with gray hairs intermixed, but that with the largest horns had the greatest intermixture of gray; they were killed on the borders of the Saguenai, in Lower Canada, where both they and a herd of buffaloes were considered as strangers. The darkest was shot in September, and the gray in November, which may account for the difference of colour*.

During the time that their horns are sprouting, the animals remain most in willow covers, returning to the evergreen woods when they are restored: their period of life does not exceed twenty years.

They are hunted in North America, chiefly during the early part of winter, and towards the spring. While the snows are not deep, they are not easily attacked; but when they begin to harden, and the hunters run on snow-shoes, they endeavour to turn the game towards ravines, or where it is drifted deep. The Huron hunters have assured us, that when this is effected, he is sure to be soon entangled,

* The measurements were taken by a string, and, consequently, with some curve on the shoulders, and convexity of the nose.

and to flounder in it; but that they must be on their guard, and run instantly upon the deep snow, to fire at him as he turns, because he will endeavour to double on his own track, and charge all that are then in his way. When first discovered, he is often found sitting on his hams like a dog, voiding his urine before he rises to escape. Against the Bear and the Wolf he stands at bay with his horns, acting offensively only with his fore or hind feet; his kick is very powerful and quick: it is said that a small tree is splintered by it.

The Indians are great admirers of the flesh: to us it appeared superior to the Stags; but under the circumstances which admit of this kind of banquet, it may be doubted whether a similar judgment would be passed in the comforts of a home: the nose and the tongue are admitted to be the best parts. Mr. Pennant states that they were once used to draw sledges in Sweden, but that it afforded to malefactors the facility of escaping, and that, therefore, the use of them was prohibited. The hide furnishes excellent leather and buff skin for belts. It is probable that the ancients knew the Elk under the name of Alce, only by description, and when Pliny compares it to a mule, he may have had the female in view. Cæsar certainly speaks of the Alce from hearsay. The Machlis may have been another animal, perhaps the Schelch of the ancient Germans*.

The *Crowned Elk.* (*Cervus Coronatus*, Cuv.) This species is known only by a pair of horns attached to a part of the frontal, in the Museum of Paris, without indication from whence they were brought. The animal to which they belonged was evidently an adult, since they bear fourteen

* Much information on the animals of North America may be obtained by consulting the *voyageurs* who reside at Sorel or William Henry, at the mouth of the Richelieu, in Lower Canada. Several of these people have traversed immense tracts of the interior.

snags, and yet they are not a foot in length. They stand about three inches asunder, and more on the forehead than in the Elk, with five snags forward, deeply indented into the blade and the summits forked: their texture is thin and light, and they must have been borne by an animal probably not larger than the Fallow-deer. It is not impossible that this is the Kistuhé, or the Little Elk of the rocky mountain Indians, which may be an intermediate between the true Elk and the Rein-deer; this would correspond with the opinion of Baron Cuvier, lately offered on this very pair; *viz.*, that they are the growth of a Rein-deer, an opinion which he supports by shewing several horns of rein-deer, approaching in form to these; but it does not appear that the specimens so produced belong to the European species: we believe them all American, and therefore may be of the same animal in a junior state.

The Rangiferine Group.

The *Rein-deer.* (*Cervus Tarandus*, Lin. Caribou of Canada?) The ancients were vaguely acquainted with this animal through the accounts which they received from Scythians and Germans. They asserted that its colour changed with the objects it fixed eyes on; that it equalled the Ox in size, and had only one horn branched in many directions: but if these tales were partial misrepresentations or altogether fabulous, there is no doubt that the name Tarandus was Teutonic, and a mere transposition of the present, with a Latin termination. Tarand, Thier-rand, Ranthier, Renthier, offer a legitimate derivation; especially as the Greeks and Romans took the word from the mouth of barbarians, whose language was without letters, and, therefore, very irregular in pronunciation.

The adult male of this species in a wild state is the size of a stag, or even superior, but the female is less than the hind, and the tame races, particularly of Lapland, are not

much higher at the shoulder than Fallow-deer. In large males the horns are sometimes above four feet long, in the females they are constantly smaller, and the palmated parts narrower. There is, however, no species of Deer whose horns vary to such an extent; it is difficult to meet two alike. In general they are at first thrown back from the forehead, and then curve with a considerable sweep forwards. Over the face they bear each two branches, mostly palmated, but also often ending in simple points, or in several irregular processes: from the back part of the curves other snags arise, or a flattened palmed termination takes place. The figure of the animal, compared with other Deer is heavy and low, resembling a calf; the neck is short; the head carried straight forward in a line with the back; the legs short and stout, and the hoofs very broad, in large individuals not less than those of an Alderney cow, and the tail short; the hair is of two kinds, one close the other woolly; under the throat it is long, and in winter long hairs more or less whitish spread over the body. The primitive colours of the Rein seem to have been white round the mouth, horns, and shoulders, passing in a bar to the flanks, rump, under tail, and round the hoofs; at least in the domestic races, though of every colour, these marks are most usually observable. Perfectly white is common among the Wild Deer of Greenland and Siberia; across the face from eye to eye, from the shoulder-blade over the loins, and upon the anterior part of the legs, there is often a dark chocolate brown colour, and on the back the white passes to the dark by an intermixture of reddish. The belly and inside of the limbs is generally white, and the females have less of that colour than the males. The fawn has no spots on the skin, but is brownish, though sometimes white. The protuberances of the horns are visible at its birth, and in fifteen days they are an inch high. In the Russian

Rein-deer these horns grow more rapidly, and become larger than in the Swedish. The males drop theirs after the rutting season in November, but the females, if gravid, keep them till May; under other circumstances, they drop theirs at the same time with the males: the new ones are eight months growing, not being complete till August. The time of copulation is in October; the bucks groan much the same as Fallow-deer, and at this time spread a strong smell like the male goat: they cover only in the night, and parturition takes place in May. Two fawns are usually produced at a birth, and their life extends to about sixteen years. Camper discovered a membranous sack between the hyoid bone and the tyroid cartilage, communicating with the larynx under the epiglottis. This organization is not found in other Deer, nor is the use of it ascertained.

Rein-deer swim with great facility, and are so buoyant as to keep half their backs above water; their broad feet, struck with great force, impel them so fast in the strongest currents and across the broadest rivers, that a boat well manned can scarcely keep pace with them. When defending themselves, they strike downwards with the horns, but do not gore; they kick with violence, and repel the wolf with success; but their most dangerous enemy is the glutton, who is reported to drop down upon them from the branch of some tree while they are off their guard. The feet of the Rein-deer produce the same cracking noise as those of the Elk; their nictitating membrane is very moveable, and used chiefly in storms of sleet and snow: this habit, together with their scent, guides them with wonderful precision through the most dangerous passes, and in the darkest stormy nights of an artic winter. To this sagacity the Laplander trusts his life with confidence, and accidents are of very rare occurrence. To him the Rein-deer afford a satisfactory compensation for all the riches, all the worldly comforts, which his terrible

climate forbids; while the food of the animal, consisting of the *Lichen rangiferinus*, *L. Islandicus*, and the buds of the coniferous evergreens and other arctic plants, is obtained with little trouble. The domestic Reins draw his sledge with such speed, that a pair of them, in the language of Lapland, *will change his horizon three times in the twenty-four hours*: that is they can pass three times the furthest limit in sight on starting, which in their latitudes is computed at above one hundred miles. The skin of the animal is wrought up for clothing, boots, &c.; the horns to make utensils; the sinews for thread; the flesh for food: the milk is drank fresh, or converted into cheese, and the serous part kept for drink; the bladder and the guts are also converted to use, and the tongues are usually exported.

Thus the possession of Rein-deer forms the sole riches of the Laplander, and the care of them his sole occupation. According to the season he migrates to the sea-shore, the low lands or the mountains. The rich among them often possess two thousand head, and the poorest seldom less than one hundred. In their language and dialects seventy-six different names of the animal or of its different states may be reckoned *. In a wild state they are gregarious; in a domestic they are not only gregarious, but possessed of an excessive attachment to each other. In both they implicitly follow an old male through every circumstance of danger or difficulty. The herdsman directs him by a whistle, and a look or a stamp of the foot will make the rest obey with a docility and quickness of apprehension which proves the superior degree of intelligence with which they are endowed †.

The Rein-deer suffer much in the summer months from insects, and particularly from the Œstris Tarandi; the

* See *Nemnich Algemeines Polyglotten Lexicon der Natur Geschichte*, under the word *Cervus Tarandus*.

† See Mr. Bullock's interesting pamphlet on a Family of Laplanders and the Rein-deer.

hum of one of these on the wing is sufficient to alarm a whole herd, and put it to flight. This is the chief cause of the migrations to the woods and mountains, where they are more free from their annoyance: the old deer, whose hide is harder than that of the young, suffer least; and it is the yearling which of all is most exposed to the painful boring operation of the Œstris, performed for the purpose of depositing its eggs under the skin of the animal. There are few wild rein-deer remaining in Lapland, but herds of them may still be seen in Dalecarlia. They exist in Spitzbergen and over the whole of Northern Russia, where the Tungusians rear a large breed, which they ride more generally than harness to the sledge. Baron Cuvier after a laborious investigation, has proved that they never extended further south than the Baltic and the northern parts of Poland.

The North American Rein-deer, or Caribou, are still very imperfectly known. There appear to be three varieties, one or more of which may actually form different species. The first is known among the Canadian voyagers as the *Caribou des Bois*, the Wood-rein; it is large, dark-coloured in summer, and presumed to be the species with flat-bladed horns, the beam being nearly vertical and unadorned with many snags*. The second resides in the dreary regions of the rocky mountains of central North America, and has been supposed to be the Mule-deer of Lewis and Clark. We suspect it to be the Kistuhé of the Kluche Indians, and perhaps the horns of *Cervus Coronatus* before described may belong to this. The third and smallest, living in the islands of the Polar Sea, Greenland, and Labrador, is the most common. Pennant and Edwards have described it, and we have a figure of the male. All are said to be whitish in winter, but the latter species most

* Since writing the above, we have met with a specimen which confirms the conjecture.

particularly so. A probable distinction by which some, if not all, the above species or varieties of Caribou, may be distinguished from those of the old continent, is that their horns are always shorter, less concave, more robust, the palms narrower, and with fewer processes than those of the former; with them, they are also said to remove the snow, as we have already stated to be done by the Orignal or Moose, but it does not appear that this practice has been noticed in Lapland. None of the Indian tribes of America have as yet learnt to domesticate them.

Fossil Rein-deer. (Cervus Guetardi.) To the rangiferine group must be added the bones of an animal discovered near Etampes in France, in the sand and sandstone formations. They consisted of a great quantity of fragments of horns, which assimilated much more with those of the Rein-deer than any other, but they were much smaller, very slender, almost filiform, and could only have belonged to a species not larger than the Roebuck.

The Platicerine Group.

Next to the Rein-deer follow the animals of this genus whose horns are still palmated, but only at the summit. They form a small group, confined to one species in the existing state, but shewing in the fossil several, among which is the most gigantic of the tribe, the celebrated Fossil Elk of Iceland.

The *Fallow-deer. (Cervus Dama.)* The horns of the male Fallow-deer, or Buck, are divergent, terminated above by a flattened longitudinal palm, toothed with what are termed advancers; the base of the beam round, with basal and median, or brow and bezantlers pointing forward. It has no canine teeth, and the nose is terminated by a muzzle: in size it is inferior to the Common Stag. In the summer both sexes have the back flanks and thighs of a fulvous-brown colour, diversified with numerous white spots. In

winter these parts are wholly brown; the buttocks are always white, with a black streak on each side; the tail is longer than in the Stag, reaching to the houghs, black above, and white below. A dark line passes along the back; the belly, inside of the limbs, and under the throat, white; the head, neck, and outside of the legs, rufous-gray. Under the eye there is a lachrymal sinus, in other particulars there is a close resemblance to the Stag.

The first year no horns are seen on the Fawn, the second, when it is styled a *pricket*, the horns are simple dags or processes; the third two branches appear, and the palm begins to be visible, but it is the fifth before the animal is allowed by the hunter to be *a buck of the first head;* after this time they only augment in volume, and in additional *advancers* and *spillers*, or snags on the anterior and posterior parts of the palm. The species is more delicate than the Stag; they *rut* later, and their horns drop or *mew* a fortnight after his; their voice is low and broken, or what is styled *groaning;* they are more easily tamed and feed with less nicety. In the choice of locality, they prefer elevated countries and hills; when hunted, they do not flee in a direct line, but in a circle and take to the water, but without venturing to swim broad rivers as the Stag will do; hence the chase requires more attention to preserve the track.

The females or Does go with young eight months, and produce one, two, or even three fawns of a light-brown colour, with white spots. Fecundity begins in the Doe from her second year, but the faculty of procreating ends in the fifteenth, and their longevity does not exceed eighteen or nineteen years. They are gregarious, and in parks the herd sometimes divides, and repeated battles ensue for the possession of a favourite spot. Germany and France contain few Fallow-deer; in Russia and the north there are none but such as are kept in a semi-domesticated state, as is the case also in England when they are very numerous.

It is doubtful, according to Baron Cuvier, whether the species is originally European, although it is said to be found in a wild state in Lithuania, Moldavia, Greece, Persia, and even China. The spotted variety of England is likewise reported to have been brought from Bengal, where none are now known. It is not impossible that the Axis of India, China, and Persia has led to this mistake, for we find the Spotted Buck noticed in *Gwillim's Heraldry*, fourth edition, 1660, page 171, where he quotes it as borne in ancient coats of arms, and therefore anterior at least to the British intercourse with India. As the Platogna of the modern Greeks is allowed to be the Fallow-deer, it must also be admitted that it must be wild, for there are no gentlemen's parks in Turkish Europe, the grand seignor's perhaps excepted. In Spain they are reported to be nearly as large as the Stag, and in Sardinia they are numerous. Hence we may infer that in southern and central Europe Fallow-deer are indigenous. Baron Cuvier shews that the ancients have known it, but they want precision in their descriptions for us to fix the names which they applied, with unobjectionable certainty. With his usual ability and learning he points out the προξ of Aristotle, the Platyceros of Pliny, and the Dama of Virgil and Ovid as referrible to our animal. The word Dama usually considered as of Latin origin, may however be viewed as derived from the Celtic roots, Da, Daa, Dun, from whence our *Doe*, Dun being almost literally translated by hill, height, down. We see Ossian's heroes, hunt the Dun-deer, or deer of the hills, and to whatever date we refer these Gaelic fragments, they are anterior to modern importation. Thus also, Daa in the ancient Danish, Dam in the Teutonic, are words more naturally referred to that most ancient language of Western Europe than to the Latin: if the Romans bestowed the name, they must also have introduced the animal, for it would be singular if a species at present common from Sweden to Gibraltar, and from Ireland to Constantinople, should have

been spread by a people into countries where they never penetrated, and still more so if they had bestowed a name, questionable by their own indications yet received by barbarians, who in no other similar circumstance have condescended to borrow from their language.

As an article of food, their venison, at least in England, is far superior to that of other Deer; beside the spotted variety, there is another of a dark-brown colour, the Fawns of which have not even the spots, so common to most others. It is reported to be hardier and to have been introduced into England by King James the First, from Norway. In the British parks, these varieties have mixed, and a great diversity of shades and colours, with and without spots, have ensued, among which the white, resulting from albinism, are not uncommon.

The *Fossil Elk.* (*Cervus Giganteus*, Cuv.; *Cervus Hibernus*, Desm.) The bones of this extinct species and particularly those which form the head, determine its place in systematic arrangement in the group of Fallow-deer, and not in that of Elks. The horns often dug out of the peat mosses of Ireland, consist of a round beam, diverging more or less from the head, with proper brow and bezantlers, the extremity alone being flattened into an immense palm, furnished on both the anterior and posterior borders with long snags. They diverge sometimes nearly in a right angle from the head, spreading over a direct line of from eight to ten feet, and even more. Since a skeleton, nearly complete, and now in the Museum of Edinburgh, was discovered in a bed of marle in the Isle of Man, its affinity to the Cervi of the Fallow-deer group has been fully established, and the height of the animal, independent of its enormous horns, admitting the skeleton to be of an adult, is proved to be inferior, or at most only equal to the Elk. The horns have invariably a brow antler close to the burr, and bending over the face, sometimes bifurcated; beyond this is the bezantler

somewhat larger; but the third or foremost of the palm is constantly the largest, measuring from eighteen to twenty-three inches; then follows another scarcely inferior, and behind that others, often divided into two processes. On the posterior edge are one or two spillers, but we have not met with a specimen, bearing more than ten branches on each horn: heads, horns and fragments of this species have been found also in England, in Silesia, on the Rhine, in Brunswick, Cleves, France, and Lombardy. As these remains are found almost invariably in recent formations and vegetable moulds, it would be more unreasonable to deny than give our assent to the opinion of Professor Goldfuss, that the destruction of this species may be of more recent date than is commonly supposed*. His inference rests principally upon the fact of a head being discovered in 1800, on the borders of the Iss, near Emmerich in a sandy soil, at a place where urns and stone axes were also found. In Ireland the same peat mosses or bogs which contain these horns have likewise produced implements of human manufacture; but the learned professor, searching in the earliest records of his country, points to a verse in the very ancient and celebrated poem of the *Niebelungen*, where, in the description of a hunting match, the hero Sifrid slays, according to the earliest, or St. Gall manuscript, the Urus, the Bison, the Elk, and a fourth animal, a fierce *Schelch*. This name which commentators without being able to point out in any other work a single indication, had referred to the Stag, the professor supposes to mean this species. As the ancient Teutonic names of the Elk were what they now are, Elend and Elk, and as the Elk and Stag are actually named in the verse, another beast of the chase with a name as closely allied to the former, as its bulk and horns actually assimilate with it also, may not unfairly be assumed

* The paper of Mr. Weaver in the *Phil. Trans.* of this year draws similar conclusions.

to indicate this very species; and we might add that the Machlis of the ancients may have designated no other *.

The *Fossil Scanian Fallow-deer (Cervus Paleodama)* described by Mr. Retsius in the Memoirs of the Academy of Stockholm, 1802. A horn dug out of peat ground, much larger than the common fallow-deer's, and having only one branch before the palm: it is bent more forwards, the palm proportionably narrower than in the living species, found at Svedala, in Scania.

The *Fossil Fallow-deer of Abbeville (Cervus Somonensis)*, also larger than in the living species; the skull without peduncles, the horns rising immediately from the frontals; flattened between the brow and bezantlers, and with a greater regularity of the palm; but these distinctions are not very positive, and although the length of the horn gives one-third more than the present Fallow-deer, Baron Cuvier hesitates whether it be a different species †.

* On referring to the text these curious lines are,—

Dar nach schluch er schiere, einen *Wisent* und einen *Elch*,
Starcher *Ure* viere, und einen grimmen *Schelch*:
Sin ros in truch so balde, das ir im niht entran;
Hirze oder hinden, chunde im wenig engan.

i. e. After this he slew straight, a *Bison* and an *Elk*,
Of strong *Uri* four, and a fierce *Schelch*:
His steed carried so quickly, that none could outrun him,
Stags or *Hinds* could scarcely escape him.

Des Niebelungen Lied. durch F. H. von der Hagen. 8vo. Breslau, verse 3760. It is curious that the *Schelch* of the Germans is found to be the *Segh* of the Britons by Mr. Hibbert.

† It appears that another fossil species, together with a great variety of bones, has been discovered in the Perrier mountain; but the work which is to describe them has not as yet reached us. It was announced in November, 1824, under the title of "*Recherches sur les Corps Organisés Fossiles*," &c. par Bravard.

The Elaphine Group.

We now come to the Stags proper, a small group composed however of species the most celebrated in the annals of the chase, and the fictions of the poets. The males have canine teeth, and three antlers on the beam, exclusive of the crown of the horns.

The *Stag. (Cervus Elaphus.)* The Stag of the European forests bears horns with a round beam slightly bent inwards at the summits, three branches pointing to the front, and the snags of the crown issuing from a common centre. The adults, male and female, in the summer, have the back, flanks, and outside of the thighs, fulvous-brown, a blackish line running along the spine, marked on each side with a row of pale fulvous spots. In winter these parts are of an uniform gray-brown; the buttocks and tail are at all times pale buff, separated from the brown by a blackish line; the head, sides of the neck, under parts of the body and legs, are gray-brown, and a broad band of brown passes down the face. All these colours become darker with age, particularly with the males. There are, however, breeds deeper in colour, who in winter are nearly black; these are most common in the German woods, the Hartz, the Ardennes, &c., and distinguished by the name of *Brandhirsch*, or burnt stag, from their colour*. Others, among which are the English, are rufous, and hence named Red-deer. Albinism likewise occurs sometimes, and was remarked even by Aristotle and Pliny. In old age they become of a gray buff colour, and there are instances also of the face being white, from whence the sign not uncommon in this country of the bald-faced stag.

* *Brand*, in the Norsk and Danish, signifies, however, the same as the French term *Entier*, *i. e.*, not emasculated, fierce; and thence a sword was named brand.

The hair of this animal is remarkably brittle, and holds to the skin only by *a small pellicle*; his eyes have an elongated pupil, and his muzzle is very broad; the tongue is soft, and ears middle-sized and pointed. The Stag is distinguished from the Hind by his horns, the long bristly hair of his throat, and the canines in the upper jaw. The calves during the first six months are brown, spotted with white; after this period the bossets or protuberances of the horns become visible in the young males, which gradually develop two simple cylindrical knobs. During the second year the horns assume the figure of dags, or spikes, and the animal is then named a *Brocket*. The third his new horns throw out two or three tynes or snags, when he is termed a *Spayad*; and the fourth year the summit first assumes the crown, or what was anciently denominated a surroyal, then in the language of sportsmen he is a *Staggard*, or Stag of the fourth year; the fifth he becomes a *Stag*, and the sixth an *Hart*. From the fourth year the horns receive little alteration in their form below, excepting in bulk; but about the crown the tynes or forks augment in a variety of shapes: this description, however, refers to horns which have their regular development, without accident, for in that case they are subject to monstrosity, as in all other deer. While Germany was more wooded, and the Stag had greater abundance of food and of repose, the ramifications of the crown multiplied in some individuals to an extraordinary amount. We have sketched one in the Museum of Hesse Cassel, of twenty-eight antlers. According to Baron Cuvier there was one of sixty-six, or thirty-three antlers on each horn. This stag was killed by the first king of Prussia, in 1696, and the horns were preserved, according to Bechstein, at Moritzburg, but Wildungen states them to have been at Königswusterhausen, in an article describing another head (perhaps of a fossil)

found near Freinwalde, in the Mark of Brandeburgh, which had, it seems, more than one hundred antlers*.

The Stag and hind had, in former times, further technical names in the vocabularies of *Venerie*. The Hart of the sixth year was an *hart of ten;* and after the seventh he was distinguished as an hart *croched*, *palmed*, or *crowned*. The Hind passed successively from the appellation of calf, to *Brocket's Sister*, and then hind, which is her third and adult state of existence.

Stags *mew* or shed their horns in the spring: the oldest first, about the end of February; the hart of ten, in March or April; and the young in May. On their losing their *attire*, they withdraw into the thickest covers until the new horns are completed, which does not occur till about August, when they begin to rub off the skin or velvet which covers them, against the stems of trees. They are able to procreate at eighteen months of age, although at that time one-third of their full growth is still wanting. The rutting season commences in September, and produces in the animal the most violent paroxysms of fury; his throat swells, he bellows, he leaves his food, forsakes his rest, traverses the country in various directions; if he meet another stag of equal age, a fierce battle ensues; they run at each other with the heads low, and with such force that sometimes the horns get entangled beyond their power of

* This learned and amiable chief forest-keeper to the Elector of Hesse, died in 1821; the work here referred to is his *Weidmans Feierabende*, 6th vol. p. 33. That Stags of this class might formerly exist in England, appears from the *Lytell Geste* of *Robyn Hood*.

"Yonder I see a ryght fayer hart
* * * * *
His tynde are so sharp, mayster
Of sixty and well mo * * *

extrication, and both die on the spot*. At this time they frequent the water's side to bathe and cool themselves, and they swim with great ease. At first the Hind flies, but is pursued and overpowered. The oldest stags *rut* first, and the season lasts about three weeks; the younger following in succession, so that the period does not terminate till the end of November. After this they are exhausted, and retire to the cover: if there be a great quantity of acorns, they are soon recovered. The Hind is gravid eight months and some days, and produces usually but one fawn or calf, in May or the beginning of June. She conceals it, and exposes herself to the pursuit of dogs to lead them from her young; the Calf remains with the Hind during the summer, and in winter the animals of all ages and sexes congregate into herds, more and more numerous as the season increases in severity. On the return of spring, the Hinds withdraw into concealment to drop their calves, and the Stags to shed their horns and regain them; the younger and the Brockets remaining together, till they part also to mew theirs.

The ancients gave the Stag a prodigious longevity; but the latest observers allow him scarce more than twenty years, which is, probably, less than his average life in those countries where he can feed and range undisturbed by man. Hinds are asserted to have been found with horns, but no well-authenticated fact places this beyond a doubt. The adult Stag is from three feet six inches to four feet high at the shoulder, and the horns seldom reach three feet in length. Mr. Pennant asserts that the Stags of Siberia

* I have seen two instances of skulls of stags entangled by the horns, and still inextricable, found in the woods, where they must have perished from inanition. I have also met with one of Elk's heads similarly locked together. It is still more frequent with the Rein-deer. Animals found in this state are named *Gusgazhiak* by the Laplanders.

are much larger, and that the breed is not quite extinct in Europe; this appears, if in reality it be the same species as ours, from a figure of the horns published by Wildungen, to which the following dimensions are annexed:—

	Ft.	Ins.
Right horn in circumference of the burr . .	0	11¼
Ditto of beam above brow-antler	0	7⅜
Length from tip to burr along the curve . .	4	0
Distance from outer tip to outer tip	5	0
Ditto between the inner tips	3	6¼

These dimensions in Rhineland feet and inches give a proportion of about one-fourth more than a large German Stag. The individual specimen reported not to be of the largest, was shot in 1815 on the estate of Councellor V. Radautz, in the Bukowine, and the horns were presented by him to Count Erbach-Erbach. These do not show that they belonged to an animal more than seven or eight years old, carrying only fifteen antlers in all.

The Stag is an inhabitant of every part of Europe, excepting Lapland. In England they still exist in Gloucestershire; and the North-West of Devon and Scotland breed them also. They spread over Russia and Tartary to Japan; but that of Corsica, not larger than a fallow-deer, is, if not a distinct species, certainly a permanent variety, and assimilates most with the Stag of Barbary, where the species is likewise found. Its colour is darker, legs shorter, and the antlers terminate in bifurcations only: if we may consider that fact as general, from the specimen figured in Buffon, compared with three individuals brought by an English gentleman some years ago from Barbary to this country. It is probably this animal which is figured in the Catacombs of Alexandria*.

* See the drawings of Luigi Meyer, by order of Sir Robert Ainslie. This is supposed to be the *Bekeel Wash* of Shawe.

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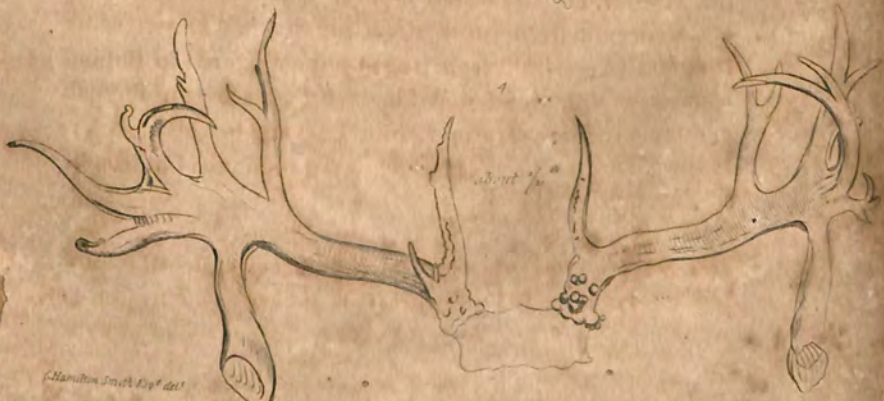

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1. Right horn of fossil Stag in Ireland from Mr. Brook's Museum.
2. North Western Stag British Museum
3. Stag shot in the Buckwane in 1815.
4. Cervus Coronatus.
5. Muntjak of the Philippines male Paris Mus.
6. Roebuck Berlin Mus.
7. Fawn of Spotted Muntjak of Sumatra. Paris Mus.
8. Muntjak of Ceylon female Paris Mus.
9. Muntjak of Java male Paris Mus.
10. Muntjak female Bullock's Mus.

From the earliest periods stag-hunting was the favourite amusement of heroes, princes, and grandees. As an art it was once considered important, and termed *venerie*, because the Stag is an inhabitant of the forest, the *chase* being applied to hunting fallow-deer, roebuck, and other animals, who resort more constantly to the plain. The study of a whole life was required to learn all its technicalities, and the experience and attention of many a laborious day to distinguish the *slot* or track of the beast from that of the hind or fallow-deer, and even of the old stag or hart from the hart of ten; and then again, if the game had or had not its horns complete. All these observations were and are requisite; for to great vigour and velocity, the Stag joins no less caution and vigilance: before he quits the wood he has already carefully viewed and scented the open country; when he returns his measures are the same, taking care to enter from leeward, so as to detect, by the scent, every suspicious circumstance: before he will *arbour*, or take his rest, he will pass the spot, return direct upon his tract, and then, at a right angle, spring off to his retreat.

Men without arms, horses, or carriages, excite his curiosity more than his fears, but dogs are an object of terror to him; from them he flies at all times, and in the chase will not stop to resist them, or stand at bay, until he is exhausted or driven into the water. With all his senses very acute, his courage, when driven to resistance, is very determined. The late Duke of Cumberland exposed one, in an enclosure, to the attack of a Bengal tiger, who in vain endeavoured to bring him down: the Stag was withdrawn after a long and successful defence.

Baron Cuvier cites a great number of places where fossil remains of the Stag have been found, and among others in England, along with teeth, &c., of the Elephant, the Rhinoceros, and the Hippopotamus, as in the same caverns of

Kirkdale, so renowned for the bones of the Hyena. We possess a drawing, furnished by the Rev. Richard Hennah, of a frontal and pair of antlers, dug out at a very great depth in the Porthstream tin-work, parish of St. Austle, Cornwall: the same reverend gentleman has likewise favoured us with the loan of another horn, twenty-two inches long, with the posterior snag of the crown broken, found in the same stream, lying on the tin ground, at the depth of about seventy feet. This specimen lay among large fragments of rolled rock, trunks of trees, leaves, and hazle nuts. Horns of the Stag have also been discovered in the same peat-mosses of Ireland which contain the remains of the Fossil Elk. In the Museum of Mr. Brooks there is a magnificent pair from Ireland; they measure three feet from burr to tip in a straight line; they have bifurcations at the summit, which we see also, though on a smaller scale, in those of Cornwall, resembling, in that respect, these horns of a dubious species of North America, which we shall notice next to the Wapiti.

The *Wapiti. (C. Strongyloceros.)* The *Canadian Stag. (C. Canadensis.)* America has also its genuine Stags, but we feel constrained to place the above names together until a precise character can be assigned to separate them. Baron Cuvier, *Ossemens Fossiles*, vol. iv., considers the question as decided, in consequence of his numerous and persevering researches, his comparisons of many horns and observations on the living animal. We also have made researches on this subject, both in America and in Europe, the result of which tends to confirm the decision of the great Zoologist. But notwithstanding this admission, we were always struck with the objection, that if the Canadian Stag and Wapiti were the same, how can it be reconciled to the fact, that the last mentioned, when first brought from the banks of the Missouri, should have excited astonishment, and persuaded a nation of sportsmen, such as the Americans, that it was a

THE WAPITI.

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new species, when the Red-deer of Virginia must have been known to very many in the Southern States, and the Canadian was still often found in the eastern? We saw the head of one shot two years before on Long Island, and actually met the animal in his native forests about sixty miles up the river Chaudiere, and therefore on the confines of Main, where, it is true, the Canadians named him Orignal, *i. e.*, Moose. Mr. Skudder, keeper of the Museum of New York, and a sound observer, was not, however, of the general opinion; he had possessed several Wapiti from the interior. We examined one together, and he did not hesitate to consider it as the same with the Canadian. The conclusion which appears nearest the truth is that they are varieties resulting from circumstances; the Canadian animal living in deep forests and rocky mountains, the Wapiti on the Savannahs of the interior. Upon a strict comparison of them both, we find that they are about one-third larger than the Stag of Europe; but the Wapiti by the side of the Canadian is heavier in body, his legs shorter, his horns longer, the antlers more serpentine, and the lowest or brow antler more bent over the face; the beam is less pearled, and the summits, in well-grown adults, bifurcated. The Canadian appears somewhat inferior in size, proportionably higher on the legs, smaller and shorter in the trunk; his hair is much more shaggy; the horns are thicker; the antlers usually shorter, in simple curves upwards; the beam browner and more pearled; the summit trifurcated, and somewhat flattened. All these disparities may be explained by the difference of the localities which they inhabit, the forest and the plain.

It is not that the Wapiti has no winter coat when his face is covered with a woolly kind of hair, the space on the buttocks is whitish, and the back, neck, and sides, of a red-brown colour; but these colours are less intense, and the legs likewise are not so dark as the Canadians. These

trivial distinctions which may, after all, gradually merge from one into the other, serve only, we think, to establish that difference which exists in Europe, between the Stag of the Ardennes, or Brandhirsch, and the Red Stag of England. The living specimens of the animals in question require to be scrupulously examined side by side, to ground a final sentence on the subject.

The Wapiti resembles the Common Stag in nearly all his proportions, but his size is far superior, being at the shoulder from four feet four to four feet eight inches*; the superiority of bulk appearing chiefly in the magnitude of the body. The Hind is similar to the Stag with inferior proportions: the colour of both in the summer season is fulvous-brown on the back; a black spot on each side of the corners of the mouth descends on the under lip, round the eye brown, and down the face darker; the neck also is darker than the body, being mixed with a purplish-brown tint on those parts; the limbs are anteriorly dark, and lighter fawn behind. Under the throat long hairs form a sort of dewlap, also darker in colour; the buttocks and tail are pale fawn colour, separated from the brown of the thigh by a dark streak; the tail is short, but varies fron two to four inches in length†. The suborbital sinus is long, open, and naked next the eye; the ears are long, lined with white hair within, and dark coloured externally. Inside of the limbs and the belly the hair is close and buff coloured.

The specimens seen in Europe appear somewhat different

* These dimensions appear superior to M. F. Cuvier's and Dr. Harlan's; but both these gentlemen give the French pouce, and not the English inch.

† This difference appears to be a probable further distinction between the two varieties. All the true Wapiti's I have seen, thirteen in number, had it very short. The Canadian, a stuffed specimen, was in bad condition, and the living gave me no opportunity to investigate this character.

in their colours from those in America, no doubt in consequence of confinement and grooming. The long hair of the throat, and also much of that on the ridge of the neck and sides dropping off. This description, derived from comparing several living specimens both in Europe and America, is the summer habit. One individual in his winter fur was of a chocolate-brown red, mixed with gray, all over the body; the neck thickly furnished with long hair, and the woolly soft fur on the forehead were sepia-brown; the chin pure white, and the buttocks and tail also nearly white.

Comparing this account with our notes taken on the spot during a winter in America, we find a stag *reported* to have been brought from the Missouri, but which in reality might have been taken in the northern districts of the States of New York, in the vicinity of the great lakes. He was three years old, four feet six inches high at the shoulder; the nose and legs sepia-black, turning on the neck and back to dun-brown; the croup and tail nearly white; the body short and thick like the trunk of an ass; the legs shaped as in a calf, very perpendicular on the fetlocks, with appearance of callosities on the knees; the croup somewhat more elevated than the withers; the neck much arched, and adorned with some long hair, the full expansion of that part not taking place till the fifth year; the muzzle broad and black; the eyes dark, and the aspect mild; the horns were greatly deformed. On the 17th of February another sketch was taken of the same animal, his horns were then beginning to shoot anew, the cicatrix of the former not quite healed, and their form resembling a flattened globe; his face was covered with woolly hair, extremely thick; on the side of the hinder legs, near the true heel, a gland imbedded in hair secreted an unctuous fluid, which seemed to cause uneasiness, and we were informed that while the horns are expanding the animal frequently rubs the points of the antlers against them; the colour of his fur was a sepia-gray, ex-

tremely shaggy. This individual was, according to Mr. Skudder, exactly similar to the specimen shot on Long Island, and might, therefore, be considered the Canadian variety; and the drawing compared with the stuffed specimen in Paris, if he be not the identical animal, closely resembles it.

The horns of this species acquire a surprising development, expanding with such rapidity that at one period their growth exceeds an inch and a half per day. The Long Island specimen of six antlers each, measured above three feet in length, and the burr and beam were exceedingly large, but in some individuals they are asserted to exceed six feet*. One specimen, of which we have a drawing, shews them nearly five feet long. The base and tertian or brow and royal antlers are invariably the longest in both the varieties; these seem to be instruments of use, for with them, when a small dead pine or a bar of a split fence sixteen or eighteen feet long lies in their way, they will lift and toss it clear over their backs.

In England, where they have propagated, it appears that some care is required for their preservation, since to an alleged neglect of this kind is ascribed the loss of no less than twelve head of the herd belonging to the king. In Canada they feed on some buds of coniferous trees and grass, and in summer on aquatic plants, which they seek under water, while sheltering themselves in that element from the bites of flies. It was in the act of feeding in this manner that we had a view of the Canadian Stag. We were in a canoe ascending the Chaudiere at a point where the river bends suddenly on opening into a small lake. A hunter among us made a warning sign for silence, and pointed *a-head*, but nothing appeared on the surface of the water; the bateau men, however, understood the sign, and grasped

* *Cuv. Oss. Fossiles*, vol. iv. p. 28.

after their muskets, but with so much precipitation and noise as to alarm the game, which now again put his head above water, and seeing the canoe, sprang forward towards the bank, with his mouth full of weeds. At this instant he was fired at, but he gained the shore very near us and dashed with elevated antlers into cover, as was thought unhurt: he appeared quite black, with large expanded horns, but no further observations could be made. We were then informed that at this period (August) they are often killed while feeding under water, but the canoe must be so placed as to glide with the current and without noise close to them, the game only raising its head to breathe from time to time, take no notice of an object which appears motionless.

On the banks of the Missouri they are said to live in small families of ten or twelve individuals, headed by an old male, who is reported to be monogamous; the rest, beside the Hind, being calves and semi-adults. The females are capable of procreating very early, one born in England having produced a calf at eighteen months old. This circumstance militates against the opinion of the Indians respecting their longevity. The males do not bellow, but when they are alarmed or excited, send forth a loud piercing whistle, to all appearance from the suborbital slit. They mew their horns in the latter days of February, or during March, and require little more than three months to recover them, notwithstanding their enormous size.

The *North-western Stag. (C. Occidentalis.)* It seems that a species of stag resides in the utmost western limits of North America, beyond the rocky mountains, so nearly allied to the foregoing, as to appear only a variety of Canadensis, or of the European Elaphus, or even Perrault's Canadian Stag. We are in possession of a drawing from a sketch representing this animal, made by a *Voyageur*, who stated it to be of the size of La Biche, with one, two, or

34242

even three successive bifurcations at the summits of its horns*. Notwithstanding this remarkable character of the horns and the colouring of the fur, it might be taken for the Canadian species, if the collection of horns in the British Museum had not produced two pair, one of which corresponds perfectly with this drawing: this pair is inferior to the ordinary antlers of the Wapiti or Canadian, and furnishes a character likewise observable in the sketch, and which is not found in other stags, namely, that the second, or bezantler, is the longest of the three on each beam; they are about three feet from burr to tip, very rugous and pearled, the brow antlers bent over the face, the bezantler curving upwards and to the front, the royal bent somewhat laterally and upwards, and the summit terminating in two bifurcations, one above the other, and with both their processes subvertically forward. The other pair much inferior in size, probably of a four years' old animal, does not present the elegant lyrate shape of the beams, conspicuous in the drawing and in the first pair; its brow and bezantlers are conjoined at the base and point, nearly vertically, and the summit bears only a single fork with both processes upwards. There is some reason to believe that both these pair were brought to England by Captain Vancouver.

In the drawing the horns shewn to the front correspond perfectly with the first-mentioned pair. The face of the animal is coloured dark-brown, a space round the eyes and cheeks buff, the inside of the limbs and chin white, the muzzle broad and black, and the lachrymary sinus long: the ears very long, dark outside, edged with black and white

* I found the original at William Henry, on the Richelieu, and the owner stated himself to have been in the fur trade, and in this capacity to have traversed the North-western country in various directions. By the name of *Biche*, the Canadians understand, I believe, the Virginian Stag; its proper signification is the Hind. He seemed unacquainted with the Mule-deer.

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THE NEPAUL STAG.

CERVUS WALLICHII. Cuv.

within; the neck, back, flanks and hams, brown; the legs ochery, and the tail rather long and dark; a small space of the breast between the fore-legs white, but the attitude does not shew whether a white disk exists on the buttocks: the figure appears light and active. Whether the horn figured by Baron Cuvier, Plate v. No. 35, vol. iv. of *Ossemens Fossiles,* can be considered as an ill-grown specimen of this species we shall not determine, nor venture to assert that this is the Mule-deer of Le Raye, or of Lewis and Clark. Should these indications be deemed sufficient to establish a species, we would submit the trivial name of Occidentalis*.

The *Nepaul Stag. (Cervus Wallichii.)* This species shews a nearer affinity with the true Stag, than the other animals of the succeeding group, by having, instead of only one basal or brow antler, two small ones at the base of each horn pointing forwards; the beam then rises in an undulating form, slightly bent back, and terminates in a point, having on the anterior face, at two-thirds of its length, a small snag or bifurcation. The only specimen known was brought by Dr. Wallich from Nepaul to Calcutta, and there figured by a native artist from the life, in the Menagerie of the Governor-general at Barrackpore: the late Mr. Duvausel transmitted the drawing to the Baron, and it has since been published by Mr. F. Cuvier. The ani-

* Le Raye's Stag, according to a MS. Journal, is described by him, "as smaller and darker than the Red Deer having *large branched horns,* the ears very large; the tail about five inches long, with short dark hair and a tuft of long black hair at the end; the inside of the limbs, belly, and mouth white." In this case the species would be found in the country of the Sioux; this description cannot well apply either to *C. Macrourus* or *C. Macrotis;* by Red Deer I presume he means *C. Virginianus,* because in speaking of the long-tailed Deer, he represents it as larger than the Red Deer, which if he meant the Wapiti, would make this an immense animal.

mal was an old Stag, so far advanced in life as to leave some doubt whether the horns are not in that state of decrepitude which accompanies old age in the deer-kind. We understood the size of the animal to be large, and the figure shews that its fur was of a yellowish-brown gray all over the body and head; around the eyes, nose and mouth, there is much whitish gray, the mark of age; the lachrymary slit, is long, and there is a black spot at the angle of the mouth on the lower lip; the ears are rather short, broad, and pointed, whitish outside, and white with three blackish streaks, as in some antelopes, on the inside; the tail is very short and, together with a large disk, spreading not below but above upon the croup, of a whitish colour; the hair shaggy and erect; the legs are mostly fawn colour, the hoofs black and pointed, and the fetlocks short and stout; the horns appear to be about one and a half the length of the head, and of a whitish colour, with little indication of pearls or rugosities. We owe to the politeness of M. F. Cuvier, the means of taking a copy from the original.

By the presence of the three small antlers, the short tail and disk on the croup, this animal is placed with the true Stags, but he is intermediate, the last of this group or the first of the next: when the animal shall be better known, this question may be finally settled.

Fossil American Stag. (Cervus Americanus.) An imperfect skull and fragments of horns belonging to a large fossil species of America is described, but the genus not determined, by Mr. C. Wistar, in the *Transactions of the Philosophical Society of Philadelphia*, vol. i,—1818. In Dr. Harlan's *Fauna Americana*, it is designated by the above name, and considered as a congener of *C. Canadensis.*

The Rusa Group.

This group consisting of Stags entirely Asiatic, is distinguished from all other Deer, by having round horns with

a brow antler, but no median or bezantler, the beam terminating in a single perch, with a snag of more or less length, placed midway, or high up, on the anterior or posterior side of it. The group is further distinguished, by having in common with the true Stags, a broad muzzle, canines in the males, large suborbital openings, a rugged mane, lengthened tail, and uniform dark colours of the hair; their stature, in nearly the whole is large, and like the Stag they reside in woody places, and have a predilection for water. These characters common to several species, appear sufficient to separate them from the Spotted Axis of Belon, Pennant, and others, and to designate it by adopting the Malayan generic name of Rusa, for this group or sub-genus.

The *Great Rusa. (Cervus Hippelaphus.)* The distinctive denomination of Hippelaphus is applied by the Baron, to a large stag attaining it is said the size of a horse, with trifurcated horns, very coarse hair, rather a long tail, furnished with long coarse bristly hairs on the throat and neck, and with the suborbital sinus large, opening and shutting at the will of the animal. All these characters apply in a nearly equal degree to several, constituting different species, or very distinct varieties; and among them the great Zoologist quotes that described by Aristotle under the name of Hippelaphus or Horse Stag, "Having a mane on the withers, but the rest of the neck to the head with but little hair; it has a beard on the forepart of the throat, cloven feet, and the head armed with horns, but the female is without them; it is of the same size as the Stag, and is found in Arachosia: the horns resemble the Roebuck's." This quotation is applicable to this group in many particulars, but as it appears to us, not entirely to any one*.

The specimens from which our descriptions are taken,

* Perhaps *Cervus Pygargus.*

are the male or Stag, figured from the life in M. F. Cuvier's *Mam. Lithog.*, and which we sketched afterwards in the museum; and a male and female from Java likewise in the Museum of Paris. The distinctive character of the species appears to be trifurcated horns; the basal antler immediately upon the burr, pointing outwards and obliquely forwards; the beam at first reclining and then rising outwards and upwards, throwing off, about midway on the anterior external side, a considerable snag, which turns up and forms the terminal bifurcation. These horns are very robust and shew the similarity which exists in those now in the British Museum, quoted by the Baron from our drawing sent him by Dr. Leach: these, however, are monstrous, the brow antlers and one of the forks not being developed, and the terminal point turning forwards; they served Mr. Pennant to constitute his species of the Great Axis, and measure two feet four inches in a line, and three feet along the curve.

M. F. Cuvier expresses doubts whether the individual here noticed came from Bengal, and we are much inclined to believe that the Indian Archipelago was its native country, because the large species of stags of continental India reside above the Ghauts, and far to the northward and eastward; they are, therefore, rarely brought to the coasts, excepting as presents to the governors or men of consequence. In the Indian Archipelago they are near the coast, and more easily forwarded in a living state; but however this may be, the specimen was in size somewhat less than the European Stag. The hair coarse and hard; from the first years that of the neck, cheeks, and throat, was longer and more shaggy, forming a kind of beard, and even a mane, which he could erect like a wild boar; his winter coat was gray-brown in different shades on the neck, back, and thighs, without disk on the buttocks. In summer he was of a more fulvous-brown; the belly, lower limbs, and inside of the thighs, whitish buff, as also the

region round the orbits, cheeks, nose, and chin. He had a dark streak down the face; the ears were rather broad, with pointed tips, nearly naked within, but furnished with long white hair at the anterior side of the opening. The Baron says, *Oss. Foss*, vol. iv. p. 41, that the buttocks are pale fawn, as in our stag; but this mark neither M. F. Cuvier's figure, *Mam. Lithog.*, in the summer coat, nor ours in the winter garb, exhibits*. The tail is dark-brown, terminated by black hairs; the breast is dark coloured, passing also along the flank; the muzzle of this species is more pointed, and the forehead less arched than in our stag. The horns augment progressively in volume as in the Spotted Axis†.

A male and female from Java likewise in the Museum of Paris, resemble the above almost completely; the female is smaller, but in other respects like the Stag. In the male the antlers are fully developed, though not quite so robust in proportion. The Stag is larger, his face darker, with a kind of band round the nose and mouth, which is white. The dark colours of the neck and back, composed of an ochery sepia-gray, extend in a list down the fore-legs, and a streak up the posterior pasterns; round the eye, ears, and cheeks, the colour is ochery-gray, and the same tones extend over the breast, belly, inside, and anterior part of the thighs and legs. The tail also is buff, terminated with a brush of long black hair.

The species has canines, and a deep suborbital opening.

* This we believe to be a mistake arising from the Hippelaphus being confounded with Equinus, which last the Baron saw alive in London, but anterior to the development of the bifurcation, and, consequently, before the specific identity could firmly be established, as we shall see when we describe that species.

† In this species the forehead is arched as in the Common Stag, and transversely depressed between the eyes. It is probable that the Persian Gewazen and the Arabian Ajal designate this species.

It inhabits Bengal, Java, Sumatra, and other great islands of the Indian Archipelago, residing in the jungle, and often on the islands in the great rivers of the country. Captain Williamson (*Oriental Field Sports*, vol. ii.) in the article HOG-DEER, speaks of a red deer with very large branching horns growing to the size of a small cow, chiefly found in the Jungleterry district, and both fierce and powerful.

The *Gona Rusa*. (*Cervus Unicolor*. Nob.) If a still stronger resemblance in the form of the horns were to have directed the name, this species might have claimed that of the Great Axis. There is, however, a difference in their being less rugged, more slender, and of a paler colour. We describe it from a drawing of the late Mr. Daniell, who says, that it is known by the name of Gona in Ceylon, and is the largest species on the island, surpassing the Stag of Europe in stature. According to the figure, the horns stand on a rather elevated pedicle, diverging from the head, with a basal antler near the burr, forming a curve forward, and the points inward of considerable length, but slender: half way up the beam, there is a short second snag, directed inwards; the ears are broad and pointed, the muzzle black and broad; there appears a smaller suborbital opening than in the former, and the forehead is covered with dark hair ending in a point between the eyes. The throat is loaded with long bristly hair, but no mane on the lower part of the neck; the tail is only a few inches long without tuft at the end; and the shoulders are more elevated than the croup. The whole animal is of an uniform dark-brown colour; the female is smaller but similarly coloured. This species resides in the Jungle and the deepest forests of Ceylon, and is said to be very bold and fierce.

The position of the second antler on the inner face of the horn, the absence of mane on the neck, and the height of

the shoulders, appear to justify its being considered as a distinct species, approaching by some of its characters to the Spotted Axis. We have applied M. Schreber's epithet, unicolor, because that author's indication will suit this better than others, he being decidedly the largest to which it is fully applicable.

In the collection of the British Museum are some horns with the second antler to the front, but of much smaller dimensions than the former. One, the skull of which is nearly complete, is remarkable for the convexity of the frontal between the horns, which rise near each other immediately from the skull without pedicle. The head measures, from between the horns to the extremity of the upper maxillary bones, about ten inches. The horns are somewhat parallel, the lower antler rising from the burr outwards and vertical: half way up the beam is the second also outwards, and obliquely to the front; they are very robust and pearled, measuring nearly two feet in length.

The next are still fixed to the facial part of the head, with the hair on, of a deep sepia-dun colour, very close and hard; the suborbital slit not determinable, but the muzzle broad and black; the horns placed on a low pedicle, diverge in the shape of a V; the lower antlers, commencing at about two inches up the beam, are placed on the anterior external side, pointing obliquely upwards and outwards. The second, near the summit of the beam, is short, and turns to the front and inwards: the whole length of the horn is twenty inches, and the distances from tip to tip about the same. This fragment was presented by Zedekiah Clark, Esq.; both are, doubtless, from the East Indies.

The Pennantian Hog-deer should be placed here, if there was not some doubt respecting the exactitude of the direction of the second antler. Baron Cuvier views it as a

diminutive species, agreeing even in colour with Hippelaphus. It may be indeed that the last-mentioned head should be referred to it, and that the height of the shoulders of two feet two inches is not inconsistent with considerable bulk of body, we having seen individuals of the spotted kind little less than the Gangetic Axis in all their dimensions, the length of the legs excepted: but, on comparing Mr. Pennant's figure with a drawing executed in India, we feel satisfied that both represent the brown variety of the Common Hog-deer, and that the error lies somewhere in the description of Mr. Pennant's specimen, which was kept by the late Lord Clive in a domesticated state.

The *Saumer* or *Black Rusa of Bengal. (Cervus Aristotelis.)* This is, perhaps, the largest species of the group resembling the Hippelaphus in the general character, but specifically distinguished by the second antler, commencing only near the summit of the beam, from the inner posterior part, and pointing obliquely to the rear. The burr is very broad and pearled; the first antler, strong, cylindrical, and straight, stands nearly vertically upon it, measuring ten inches in length; the beam bends from the back of it, obliquely outwards, and to the rear, and with a sweep turns its point backwards; near the summit, or at more than two-thirds of its length, is the second posterior and internal branch, short and pointing upwards. The specimen in the British Museum measures about twenty-three inches, and is very robust and rugous. The horns stand upon a short and broad pedicle; the face is straight, the nose pointed, the muzzle small, and the suborbital opening is very considerable. The ears are broad, with white hairs standing up around the orifice; the tail reaches half way down the ham, is black, and well furnished with hair. The neck and throat are covered with long, coarse, dark-brown gray hair, reaching partially over the shoulders, susceptible of being

raised like a lion's mane, when the animal is excited. The head, shoulders, back, rump, and buttocks, are dark-brown in summer, and almost black in winter; outside of the ears sepia; the belly whitish, as also a ring round the nostrils and mouth, separated from the brown by a deeper shade, which spreads up the face; the inside of the limbs and legs are fawn colour, darker over the knees down the front, and the breast black. This is the appearance of the adult stag, the hinds are much smaller and paler in colour. In the collection of drawings executed in India in the possession of M. F. Cuvier, is the figure of a Rusa, five years old, which lived in the Menagerie at Barrackpore.

According to the information received from friends, the male is nearly the size of the Elk, and indeed is so named in India by the British sportsmen. They represent him as excessively strong and vicious. Some of them on a shooting expedition had crossed an arm of the Jumna to a woody island in quest of game, they were on the back of an elephant, and, entering the jungle suddenly, roused an old male of this species. On seeing the elephant he started up with a loud shrill pipe or whistle, which caused others to rise and dart into cover, while he stood at bay with his bristly mane on end in a most threatening attitude, but before the sportsmen could prepare proper shot, he wheeled round and dashed through the underwood with the facility of a rhinoceros. Captain Williamson evidently met the same species. He describes the Stag as arriving at the size of a Lincolnshire cart-horse, fifteen or sixteen hands high, shining black, with tanned points (of the hair?). One of these, he says, heads a score of females, who are of a mouse colour. He too calls it an elk, and adds that they reside in the Prauss jungles.

Of the two heads in the British Museum, one bears the horns already noticed, and the frontal shews a high ridge

between the horns. There is, besides, another with the skull nearly perfect, and the horns very robust, but rather short. In the Paris Museum is one of smaller dimensions, brought from the coast of Coromandel, probably of this species, but younger, the horns being less developed.

The *Malayan Rusa. (Cervus Equinus.)* In the description of Hippelaphus the Baron refers to a specimen which he saw in London (*Oss. Foss.* vol. iv. p. 40), reported to him as coming from Bengal, and which at that period had only its first horns or brockets. It is, however, more likely that it came from the Indian Archipelago, although there is great probability that the species also resides in India. We saw this individual in the Menagerie of Mr. Cross at Exeter 'Change, and made two drawings of it, the first during the same season when M. Cuvier was in London. The animal was then about two years old, and his horns were simple, or in the brocket state; the next year its new horns shewed the bifurcation of the summit to be as in the Black Rusa of Bengal; that is, near the summit on the internal posterior side. It was then four feet or something more at the shoulder, and still higher at the croup; its eyes were large, dark, and mild: the suborbital slit opened at pleasure, and was remarkably expanded when it drank, with a perceptible action of the air passing in and out, as before noticed. The ears, broad and pointed, were nearly naked within and whitish-gray without, the face, shoulders, back, and thighs, were of a dark-brown gray; the hair rough and bristly on the neck and throat. This colour was darker, and the hair very long, especially the second year, when the crest or mane on the neck and throat hung very heavy and thick; the breast and belly were dark ashy, almost black. A considerable disk of a clear rusty, or orange colour, expanded over the buttocks, lined the inferior side of the tail, and was separated by a black line from the gray of the thighs. The tail, about a

THE MALAYAN RUSA.

C. EQUINUS. Cuv.

foot in length, was black above; the joints of the legs, the inside of the thighs and their anterior side were yellowish-dun, and the legs from the joints downwards buff; the chin was white with a black spot at the corner of the mouth on the lower lip, and a bar of the same colour above the nostrils, which were placed on a black muzzle; the cheeks and space round the eyes were buff passing to gray. It had canines, and Baron Cuvier detected them likewise in the female.

The horns are of a dark colour, rugous, robust, but shorter and less curved than in the Hippelaphus; the anterior antler and posterior snag are both short and obtuse, but from the size of the first or brocket horns of the animal being near eight inches long, it is presumed that they become, if not much prolonged, at least very bulky: his second horns were about fourteen inches. This species resembles the Bengal Rusa in many particulars: both have the forehead flat and face straight; the muzzle small with spots of black on the under lip, and a ring round the nose; the ears naked inside; the horns short, stout, and similarly formed; the same mane and dark breast. In fact, the only obvious differences are the presence of a disk on the buttocks of the present, which does not appear on the former, and that of dimensions, but even in this particular there can be no great disparity. It may be, therefore, that ultimately these two will be marked as only varieties of one species.

The sailors and the people at Exeter 'Change, named it Jamboe and Great Water Stag, no doubt a corruption from the Javanese name Mejangan *Banjoe*. It was decidedly the same species which Sir T. S. Raffles described in the *Lin. Transactions*, under the generic name of Rusa. The Dutch of Java call it the Elk. Sir T. S. Raffles mentions a smaller variety of a deep-brown colour, nearly black, named Rusa Etam and Rusa Kumbang by

the Javanese, where both species are found. This smaller may be the Middle Axis of Pennant, established upon the examination of the horns in the British Museum already noticed *.

Rusa of Timor. (Cervus Peronii.) The Baron describes a head in the Paris Museum, brought from Timor by the late M. Peron. The beams of the horns are rather slender, and the posterior snag is more equal in length with the summit of the perch; these horns are of a pale-brown colour; the skull shews a longitudinal elevation of the cranium between the horns very prominent, and the posterior angle of the orbit is raised in a remarkable manner; it has canines, and the head long and pointed, but the colours of its fur are unknown. The learned author suspects this to be Pennant's Middle Axis, and the adult of the species which Dr. Blainville describes by the name of *Cervus Niger*, from a figure in a collection of Indian drawings, said to be in the British Museum, but where upon inquiry it is not found. It is probably a mistake, and that the original is in the collection at the India House. The engraved copy shews the usual fault of India drawings of deer, in the legs being too short and the figure clumsy †. Were the original without any description, we should consider it as representing a small animal of the Porcine Deer species; the horns being ill-grown, the oval form of the head, the great elevation of the croup, the absence of bristly hairs on the breast, and the form of the tail, appear to justify the conjecture.

* One or more of these species are said to be gregarious, and occasionally driven in large herds to some point or station where great numbers are slain.

† I judge this to be the case from the number of living subjects copied by myself and others, always differing in this particular from the designs of Indian artists of the very same species. I possess several in which this want of feeling, expression, and proportion, is remarkable, though the drawings are otherwise highly finished.

BOMBAY BRANCH

CUTIA OF THE MARIANAS.

C. MARIANNUS, Desm.

In this figure the horns are almost simple, the beam having only a very small antler on the front of the base, and the rest bending back, and then upwards; the colour of the face is brown-black, particularly about the eyes and mouth, and clearer under the belly, the internal face of the limbs alone being white; the tail is rather long and black. The whole appearance is in outline similar to an Indian drawing we possess of the dark Porcine Deer, and the colours are not very dissimilar: it may be a new species, for we see no indications by which it may be referred to this or the next.

Rusa of Malacca. M. F. Cuvier *(Mam. Lithog.)* represents a female from the Peninsula of Malacca of the size of the hind of Europe. Its colour is brownish-black, excepting the border of the lips, inside and base of the ears, inside of the limbs and legs, which are white; the tail is black, and broader at the point than at the base; the edge of the buttocks rust colour, and a pale streak runs across the inner angle of the eyes; but the most remarkable character is a depression above each eye, forming a sinus analagous to that of the Chamois, but which this last animal has behind the horns; the hair is hard and strong. M. F. Cuvier states, that the animal, while living in the Menagerie of Paris, was mild and perfectly tame, it would follow like a dog, and would scarcely suffer itself to be intimidated. The Baron conjectures that it might be the female of *C. Hippelaphus*, and we are inclined to view it as the Hind of Rusa Etam of Sir T. S. Raffles.

Rusa of the Mariannas. (Cervus Mariannus.) There is in the Museum of Paris, a specimen brought from the Marian Islands by Messrs. Quoy and Gaimard; it is more robust but not much taller than a roebuck, with round divergent horns standing on a low pedicle, having two antlers, the basal nearly vertical, and at its junction with the beam a small process not unlike a trilobed tooth; the

other is posterior and internal, and compared with the size of the head, the horns are large and heavy, being about thirteen inches long; their colour is ashy, and they are extremely rugged. Between the horns the skull has a longitudinal eminence, and before the orbits, near the base of the nose, are two longitudinal convexities very remarkable, and the species is destitute of canines, by which character it approaches nearer to the true Axis; the face is almost black, with a streak running down from the horns, between the eyes to the nose; the muzzle small and black, and the colour of the whole body dark-brown, slightly mixed with gray, at least such are the colours now discernible, the specimen being in a bad state of preservation; the tail is about four inches long and black.

A fawn brought from the same island in the above museum is fulvous-brown without spots; the throat is whitish, a white spot at the end of the lower jaw, and one at the base of the ear. The inside and anterior border of the thighs and buttocks are white, and the legs buff.

From the similarity of structure in the skull there is a probability that the same species inhabits Manilla; the markings and colours being also nearly the same, only that in this, canines appear, which the other seems to be always without *.

The Axine Group.

Although the true Axines have horns of a similar form with the Rusas, their structure is more slender and less rugous. The animals themselves are small, the largest not exceeding the Fallow-deer; they are without canines, and their fur is mostly spotted with white. The ancients knew

* It appears that Baron Cuvier has distinguished one of this group by the name of *Cervus Duvaucelii*, but I do not find which, unless a new species should have been established by him since the publication of his *Ossemens Fossiles* of 1823.

two species of ruminants with spots, inhabiting the East, the Axis and the Jorcos. It appears probable that by the first they understood the same animal as modern Zoologists; but the second is more doubtful. The most obvious application would have been to the Hog-deer of the moderns, if it were not improbable that the trifling distinctions between this and the Axis had been noticed by the ancients: we may therefore suspect that by the Jorkos they understood the Jasin or Antelope, which, although not exactly spotted, is often agreeably diversified with fulvous black and white; and that this supposition is not quite fanciful, appears from the *Institutes of Menu*, where the Jasi or Antelope is repeatedly mentioned as spotted, which phrase is used also in other Indoo codes, and the animal itself portrayed.

The *Spotted Axis. (Cervus Axis.)* This species nearly resembles the Fallow-deer, but is readily distinguished from it by the round horns without a terminal palm; they stand nearly vertically, with a slight bend forwards, the points approaching each other; at the base an antler arises from the front, and is pointed forwards; another half way up the beam on the internal side is turned to the rear. There appears no suborbital opening, and, as we have said, the canines are wanting in the jaw; the muzzle is black. These characters are constant; but to distinguish the female from the doe of Fallow-deer, or the males, when destitute of horns, from each other, is more difficult.

From the accurate comparisons of M. F. Cuvier, it results that both have the back, shoulders, flanks, and thighs, of a fulvous colour, spotted with white. On the buttocks of both and along the sides there is a white line, but pure in the Axis, more yellowish in the Fallow-deer; a dark-brown line runs along the back of both, but darkest in the Axis, and covered with white spots; while in the Fallow-deer the line is paler, and the spots range only along its

border. The Fallow-deer have the head pale brownish-gray; the Axis bears a dark spot on the forehead, and a blackish-brown line down the face. Fallow-deer have the buttocks of a pure white, marked on each side with a black line, and the tail, black above, is white below; the Axis shews no white on the buttocks, the fulvous of the thigh extending over that space, and the tail itself is of the same colour, with only a part dark towards the tip; the belly and interior of the thighs are white, and the rest of the limbs pale-brown; the convex part of the ear is brown-gray, and the internal border black. But the Axis, although he sheds his hair, does not, like the Fallow-deer, change his colour; his muzzle is broader, and the head thicker and longer. But these distinctions are not constant in all the varieties and breeds.

The Dacca districts and Rohilla country replete with forests, seem to produce the large fulvous varieties with two rows of oval white spots on the back, and with higher shoulders than the smaller, which are the true Hog-deer of Indian sportsmen on the Cosimbasar Island, in the Jungleterry and the Bahar. Some of the latter have the belly of the colour of the flanks, a sort of mouse colour, with a full white streak along the side, and two large oval white spots on each side of the tail, which is also shorter than in other varieties. In the forests of Ceylon they are also large, straight-backed like a cow, without the oval rows and chocolate streak on the back, and the face is wholly buff, with the nose rather prolonged.

The female is larger than the doe, and her head somewhat longer; the male is about the size of the Fallow-deer; the fawns are marked with spots like the adults. In their habits they are gregarious and pacific, the males living peaceably with the females *. The voice of the Axis is a

* M. F. Cuvier mentions a singular habit in a female of twisting the neck upwards, somewhat like the Wryneck, without any

kind of barking, not unlike the voice of the Stag, and his manners are also similar. In India all the varieties are known by the general name of Hog-deer, and called in the Moorish language used in the country, *Parrah*. They are found most usually in the heavy grass jungles in the lower provinces, and to the northward in the *Jow* and *Surput* jungles along the banks of the rivers; they feed in preference on the silky grass, used for making twine, called *Moonge*, if it be found near some heavy covers where they breed, and from whence the female leads her fawns in twelve or fifteen days after birth. They are extremely indolent, feeding at night, and passing most of the day in sleep; and, perhaps, on that account they are averse to, and will not remain in the vicinity of, Wild Pea-fowl. They are fleet for a short distance. The doe is seldom seen in an advanced state of pregnancy, keeping at that time in the cover, and the bucks are then very vigilant and fierce in their defence.

The Spotted Porcine Axis is a smaller variety, with a shorter head, and still shorter legs. Their horns are very slender, and the branches only short processes. In the colouring of their fur the white spots are smaller and more irregularly disposed, and the forehead is without the dark central spot. The cross breed between the large and smaller varieties partakes of both, having the large body with the regular row of oval spots and some marks on the face, as in the former, and the short fore-legs, elevated croup, shorter head, and slender horns of the latter. It is asserted that the Axis and Fallow-doe have bred in England.

The *Brown Porcine Axis. (Cervus Porcinus.)* It is a question whether this be a variety or a species; if there be no error in Mr. Pennant's description of Lord Clive's speci-

seeming cause, but we have never observed it in others, and believe the present instance to have arisen from a private cause not attributable to the species.

men, Baron Cuvier's judgment would decide it a species, from the circumstance alone of the superior antler being anterior and external: but the drawings of this animal, executed by Indian artists, which we have seen, shew no characteristic difference in the horns, though in other respects they resemble Pennant's figure, and therefore our doubts still remain. In these drawings the horns are very slender, about a foot long, very distant at the base. They are parallel with the face, slightly bent, with a small process at the anterior side of the beam, and a very diminutive bifurcation turned *inwards* at the summit. The head is oval, the muzzle small, measuring altogether about eight inches in length; the ears short, round, naked, and rose-coloured inside, with a few white hairs at the orifice; the body from nose to tail is above three feet long; the shoulders more than two feet from the ground, and the croup something higher; the neck, back, shoulders, flanks, and croup, are fulvous-brown; the face, and a ring surrounding a buff-coloured border round the eyes, are pale gray; the cheeks fawn colour; under jaw and throat white; the tail rather long, is brown above and white beneath; the body is thick and clumsy, but the legs fair and slender, of a buff colour, with some white on the inner side of the thighs and fore arm *. The animal is rare.

Dwarf Axis? (Cervus Pumilio? Nob.) A fragment of a frontal, not above three inches broad across the horns, preserved in the Royal College of Surgeons, London, may be a very diminutive species of this group. The pedicles are low, supporting a pair of whitish miniature antlers, with a slightly-pearled burr at base, above which rises a smooth vertical process, little more than an inch high. On the right horn this commences near the base, on the left three-fourths of an inch above it; the beam recedes slightly, and

* Measured from a skin without horns.

assumes the form of a flattened spike about two inches high, ending in a point; between the process at the base and the beam, the horn is compressed as if hollowed out; the animal to which this fragment belonged, cannot have exceeded the smallest antelopes by more than an inch or two. If this should be a species, we would name it Dwarf Axis, *Cervus Pumilio*.

The Capreoline Group.

The horns of the Capreoline group, in general, are a diminutive representation of those borne by the Rusas of the Mariannas and Moluccas; but the animals are shorter and more elevated on the legs, they are destitute of tail, and have no lachrymary sinus. In general, the horns developing, as in the rest of the genus, from a first pricket to a second, with antlers, and these in their turn enlarging with age. The complete form, however, consists in having only two antlers, or rather processes, the inferior forwards, and the superior to the rear, which, with the point, make three; but occasionally tubercles swell into processes, and then they seem to have four or more. Indeed, the Roebuck group is more subject to diversity of horn than any other deer, the Rein excepted, probably from their residing much in underwood, which being apt to inflict wounds while the horn is tender, produces diseased and monstrous formations. There is in the Museum of Berlin, a specimen whose horns are without lower antlers, but the summits are flattened with four processes on the one, and seven on the other horn, yet so regular, that, taken by themselves, they would appear as belonging to an unknown species. There are, besides, others diseased, where all the processes are uncinated, and we have seen one in which the pair united into a globular mass, nearly as large as the head.

The Roebuck group belongs exclusively to the Old World,

and is represented in the new by the Cariacou-deer, and by the Brockets of South America.

The *Ahu or Tartarian Roe. (Cervus Pygargus.)* Although this animal must be considerably larger than the Roebuck of Europe, and the great expanse, solidity, and ramifications of the horns, produce a very different aspect, yet their character is fundamentally the same: this affinity is further supported by the absence of tail and of lachrymary sinus. Pallas and Gmelin have both described the Ahu, no doubt from the name in the Tartar dialects, and even in the Persian, being generical: the latter, in particular, seems to have known only a variety of the Roebuck; but the former, although we learn from the Baron, that ultimately he too viewed his Pygargus as a mere variety, described nevertheless the true species of Pygargus, but in its junior state.

According to Pallas the Pygargus is a native of Hircania, Russia, and Siberia, inhabiting the loftiest regions, and descending in winter to the plains. In form it resembles the Roebuck, but is larger. Its colour is brown, with the under parts of the body yellowish; the hinder parts of the thighs are white, forming a large disk on the buttocks; the space round the nose and sides of the lower lip are black; the lips themselves white. In winter the fur assumes a hoary appearance: the ears are lined with short white hair, and the orbits surrounded with long black hairs. The whole coat of the animal is excessively thick, and in the spring grows remarkably rough and erect. It has no tail but a mere cutaneous excrescence. Of the horns he says, merely that they are strongly tuberculated at the base: but, referring to his figure, we find them broad with the inferior snag high upon the beam and much developed, and the posterior bending down in the form of a hook: he omits also the dark tips of the ears, and the streaks on their inside. So far the presumption that the

animal in question is only a large variety of the common might be maintained, notwithstanding several minor indications of diversity of species.

But we found in the Museum of Prague, in Bohemia, a remarkable pair of horns, presented to that establishment, as we were informed, by a Polish nobleman, who brought them from Russia, and said that they were of the Roebuck of Tartary. We observed another pair perfectly similar in the Museum of Frankfort, where they were considered as belonging to a roebuck. These came out of the collection of deer's horns of some nobleman in the vicinity without indication. It was, however, admitted, that no frontal much inferior to the Stag's could afford room for their burrs, and, therefore, that the Roebuck was too small for them. These two pair shewed the base of the horn subvertical, reclining backwards and outwards, very rugous, tuberculated, and pearled, some rising nearly an inch high. The anterior antler commences where the beam curves back; it is vertical with several processes beneath. The beam then bends outwards, and terminates into a bifurcation, the anterior being dichotomous, and the posterior turning horizontally inwards, so as nearly to meet its fellow from the opposite horn, the termination being forked also. They were of a deep-brown colour, and measured between thirteen and fourteen inches from burr to tip. The diameter across the base of both horns and the frontal about five inches.

These specimens established the existence in northern Asia of a species of buck superior to the Roe of Europe, and even to the Fallow-deer, and which cannot be referred to any known species excepting the Pygargus of Pallas, whose figure in that case must represent the Buck of at most the fourth year. In turning over a series of Indian drawings of plants, insects, and animals, in a printseller's shop, we found a representation of the animal, which we

think establishes the identity. In this figure the ears are whitish both within and on the outside, with three dark streaks, as in the Antelope, on their inner surface, a large white disk on the buttocks, and only a rudiment of tail. The horns exhibit the same characters as the preceding, and the animal appears more robust and shorter on the legs than the Roebuck. There is also a slight indication of a fold below the eyes; the colour of the coat is a rufous brown; the legs and face dun. By this drawing, the work of a native artist, it would appear that the species extends to the southward, probably to the foot of the great chain of mountains where Captain Williamson found the Roebuck, which from his account would seem to be the common species*.

The *Roebuck. (Cervus Capreolus.)* The Roebuck is the smallest of European Deer, not above four feet long, and two feet eight inches at the shoulder. There are two varieties of colour, one very red, and the other yellowish-brown gray: there is even a third nearly black in the Duchy of Luneburg, in Hanover; but all have a white disk upon the buttocks round the insertion of the tail, which is only one inch long, and does not protrude beyond the hair. In summer, however, the disk is totally or partially obliterated; the hair is then softer, and the head and neck slightly mixed with gray: in winter the fur is closer and darker; on the back and neck also the colour is deeper than below; the muzzle, which is small, is surrounded with deep brown, leaving two white spots on the upper lips, and one on the lower. The species is destitute of canines and lachrymary sinus: with the exception of the horns, the female is like the male, and the fawn is spotted with white. In the second year the young buck bears prickets, and the third a small antler is seen on the front of the beam, after-

* General Hardwick has lately given an account of the *Cervus Pygargus* to the Linnæan Society, but the paper is not published.

wards a second antler points backwards, somewhat higher than the first, and forms a fork.

The Roebuck is extremely graceful, active, and even daring; his eye is fine and full, and his limbs remarkably pliant; he is cleanly, leaps with great vigour, and resides in preference on elevated ground, not so much in the forest as on its borders, and in coppice; he leaves a strong scent, and is thus more exposed to the pursuit of dogs; but his instinct is more fertile in resources, which he employs the moment he is hunted, without previously exhausting his strength in a prolonged course: he begins, after a first dash forward, by doubling over his track, to mislead the hounds, and then, by some great bounds, he springs off towards a cover, where he lies down to let the chase pass. His manners differ likewise from the Stags; for he remains attached to one female, who produces usually two fawns, one of each sex: these, when grown up, pair off together. The Bucks rut in the beginning of November, when the young of the family are for a time driven off, not to return again until they are full grown. Gestation lasts five months, and the female withdraws into the closest cover to drop her fawns, and re-appears in about twelve days with them in company. If there happen to be danger, she conceals them, and then advances to meet it, exposing herself to attract the attention of the enemy. The Buck mews his horns after the rutting period, and recovers the new during winter. They live from twelve to fifteen years; but many perish in severe seasons. The venison of adults is not much esteemed, though the brown variety is said to be superior in that respect to the red.

Roebucks are found over all Europe, and part of Asia. There are now very few in England, but still a sufficient number in Scotland. They are delicate in their food, and pick the buds and small shoots of several kind of trees

in preference to grazing, and thereby commit some damage in the forest. No art can completely tame them, their distrust remains invincible. Mr. Bewick relates a remarkable anecdote of one, which, being hunted out of Scotland, through Cumberland, and various parts of the north of England, at last took refuge in the woody recesses bordering on the Tyne. It was repeatedly seen and hunted, but no dogs were equal to its speed: it frequently swam the river, and, either by swiftness or artifice, eluded all pursuers. It happened during the rigour of a severe winter, that being pursued, it crossed the river upon the ice with some difficulty, and being much strained by its violent exertions, was taken alive. It was kept for some weeks in the house, and was then again turned out, but all its cunning and activity were gone; it seemed to have forgotten the places of its former retreat, and after running some time, it lay down in the midst of a brook, where it was killed by the dogs.

According to Captain Williamson a species or variety of Roebuck exists in India. He says that "The Roebuck is not unknown in Bengal, but is only found on the borders, particularly along the western frontier among the crags and ravines. It is found in elevated situations, but in general is extremely shy, and frequents such covers as are divided into small patches. They do not grow near so large as I have seen them in Scotland."

The *Fossil Roebuck.* Horns and fragments of a species of Deer which appears to belong to this group, have been found in calcareous marle in the environs of Orleans, with fragments of Paleotherium and Mastodon, and in the peat earth of the Somme, in France. The latter are decidedly of the true Roebuck, but there is a difference in the teeth of the upper jaw of the former sufficiently marked to distinguish them specifically and almost generically from the whole genus, and approaching, especially by the two first

molars, to the Musks, and thereby proving a further affinity in the two genera of the family.

The Mazamine Group.

The next group of Deer composed exclusively of American animals, appears to be that to which the generic term of Mazatl or Mazame (including indeed other ruminants) was bestowed by the aboriginal nations speaking the dialects of Mexico, or the Toltecan and Astecan languages; they are distinguished from other Deer by having in general smaller horns, with a tendency to flatten, bending more or less into segments of a circle, the concave part to the front; with only one anterior antler, and the others either posterior or vertical. Their tails are longer than the preceding, the heads longer and finer, and they are furnished with a brush of erect hairs on the inner face of the hinder joint; they have a small suborbital pore, appearing like a simple fold of the skin; a muzzle, but no canines; their eyes are large, prominent, and soft, and the ears in general long. It is as yet a question, whether the specimens here described constitute in reality different species: to admit them all as such, would, perhaps, militate against precision, as it cannot be denied that several exceed the proper limits which should guide us in this difficult genus, where trivial and external characters are necessarily the only criterion.

Virginian Deer. (*Cervus Virginianus.*) The Virginian Deer forms the most prominent species of the group, and serves for a type of the others. It is about three feet three inches at the shoulder; light and elegant of form, with a long tapering nose; the horns reclined on the head turn outwards, and then with a very decided curve, point their extremities forwards; the burr is small, and near it, on the internal side of the beam, rises a single short antler, inclining inwards in the direction of the

beam; the first horn is only a simple pricket; this is succeeded by a fork on the summit; then two and three snags on the posterior part of the curved beam, pointing upwards, which is a mark of the fifth year. In old animals the superior part of the beam flattens, and the snags and point become dichotomous; while the burr having widened considerably and increased the length of the brow antler, throws up spurious collateral shoots round the base. Measured along the curve, the horns scarcely exceed twenty-five inches in length: they sometimes vary, so that in the fourth year only simple prickets about seven inches long are thrown out; which malformation has given rise to a supposed Deer with single horns, known in the United States as the Spring Buck of the Jerseys*.

In summer the coat of the male and female, is of a bright fulvous cinamon colour, changing into a fine brown-gray in winter, the hairs being then annulated with brown and buff; the belly, inside of the thighs, the internal face of the fore-legs, above the knees, and the posterior inner border of the buttocks, are white; the throat, breast, and under part of the tail of the same colour; the upper part of the tail is dark, and the legs fawn colour; the ears are long and pointed, outside of a brown gray, inside well lined with white hair; the forehead, face, and cheeks, brown, with a slight mixture of gray; round the eyes, lips, and chin, fawn colour; the muzzle small and black, no spot on the corner of the mouth, but the winter hair of the belly, and under part of tail long and silky, and the bristles on the inside of the hinder joint, or tibiotarsal articulation of a deep rust colour: in this animal the eyes are peculiarly bright, soft, and beautiful.

This species exemplified from an individual of uncommon

* The horns of one in the Museum of Philadelphia, correspond exactly with Cuvier's figure 10, pl. 5 of vol. iv. *Ossemens Fossiles.*

beauty, sketched at New York, was in the fifth year of his age; the horns were smaller than the specimen figured by M. F. Cuvier, the snags more slender and developed; and on the croup were two crescents marked by the friction of the horns on those parts, from some habit in the animal.

The fawn is of a lively fulvous-brown, marked during the first year with numerous white spots. They rut in November and December, when the neck of the Buck swells, and gestation lasts near nine months, the females dropping two or even three fawns. The Bucks lose their attire about the same period as the Stags of Europe; they bray but with less noise, and live in herds from the southern confines of the great lakes and the St. Lawrence to the Floridas, and westward, in the interior to an immense distance. According to Professor Harlan, this species displays great enmity towards the Rattlesnake, which it contrives to crush, by leaping, with the fore-feet conjoined, and dropping perpendicularly on the serpent, bounding away again with great lightness, and repeating this attack till the enemy is killed.

Dr. Say notices a variety found at Engineer's cantonment in the interior of North America, marked with a white triangle on the front of all the feet, the point upwards, and a black mark on the lower lip strongly characterized, and not so far back as the angle of the mouth as in the former: its dimensions are somewhat less, and the weight one hundred and fifteen pounds.

The Virginian Deer appears to be Lawson's Fallow-deer, and sometimes the Red-deer of the United States, though Mr. Warden applies this name to the Wapiti. The skin is used for gloves, and the native Indians of the interior dress them in an excellent manner to make leggings, jackets, and maukissons. It appears also by the mummies dug out of the saltpetre caves of the interior, that anciently they wrapped their dead in them.

Mexican Deer. (Cervus Mexicanus.) This species not as yet figured, was first noticed by Mr. Pennant, who represented the horns, (*Hist. of Quadrup.* p. i. xx., fig. i.) from a pair in the Museum of the Royal Society and now in the British, to which the ticket of *Mexican* was attached. With this information he inferred it to belong to Hernandes's *Teutla Maçame*, and Dr. Shaw says "that it is about the size of a common roebuck, and of a reddish colour, but when young is often spotted with white; the horns are thick, strong and rugged, they bend forwards and are about ten inches long, and trifurcated on the upper part, but they sometimes vary in the number of branches or processes; the head is large, the eyes large and bright, and the neck thick." That author next describes what he supposes a variety, from a pair of horns, styled by Grew, horns of the Indian Roebuck; this is probably the pair still in the British Museum, of which the following is a description: they are of a bright yellow colour, so irregularly and widely palmated as to cause a suspicion, that they once belonged to an unknown species of Rein-deer, or to a second species of Elk; they are nearly seventeen inches long, spreading diagonally from the head and reclining back; there is *no burr* at the base, only a broad, ascending, tuberculated, and toothed beam. At two inches from the base an antler issues from the anterior part in a vertical direction, flat and ending in two points: about three inches higher the beam, being somewhat prismatic in form, widens, and a broad flat branch throws up four snags in the form of a palm, the foremost plain, the next toothed, the third plain, and the fourth bifurcated: behind these a fifth assumes a still more singular form, it ascends in the same direction with the others, terminating in three processes, and from its external posterior side throws out an horizontal branch which bifurcates again, the inferior being the longest and hanging downwards, this is the right horn; the left, after the basal

antler, throws obliquely forwards a flat broad branch dividing into two processes, then vertically one with three external processes, and then a third likewise with three external processes, but these three branches flatten also at base into a kind of palm obliquely facing the other *.

M. F. Cuvier describes the horns as strongly curved forwards, spreading outwards, and converging towards each other at the extremities: an antler at the anterior face of the beam, pointing vertically and furnished with strong denticulations; a spiller or antler at the posterior part of the beam, divided into several small branches: these horns flatten into a sort of palm from the second antler, and at their base are deeply grooved and strongly tuberculated. The head in the possession of the describer, was very adult, and had a muzzle but no canines, which forms a further indication of affinity with *C. Virginianus* †. From these descriptions, and the figure in Pennant, and in *Oss. Fossiles*, vol. iv, pl. v. fig. 23 of Baron Cuvier, it is evident, that if the species be the same, there is a very great difference in the development of the horns, and that the name of Mexican as applicable in particular to the palmated pair, is very problematical. There is, indeed, some suspicion that they belong to a deer of the cold extremity of South America; for although we still find an indication of affinity with the Virginian Deer, it is through a succession of gradations, the extremes of which have no longer the appearance of a common original type.

* I find on my sketch the words *Cervus Mexicanus*, but doubt whether they were subjoined from any written ticket attached to the horns themselves; they appear to belong to *Cervus Ramosicornis* of Blainville.

† On referring to fig. 23, pl. v., vol. iv. *Oss. Fossiles*, it is plain that these horns are far inferior, and very different from the pair before described, and leave little doubt of their being of different species.

Before the publication of the last-mentioned work of the Baron's, in which this transition is depicted, we had made constant researches in museums, and among others in that of the Royal College of Surgeons, the British, the Leverian, Mr. Bullock's, and Mr. Brooks's. In the collection of the last-mentioned gentleman we found another pair of a bright golden-yellow colour, very robust, rising from the burr with strong pearls, and a small antler in front: behind this, and in contact with it, a second snag, strong, vertical, notched, and grooved; the beam then bends out at an angle, horizontally and laterally, and then curves forward. On the superior edge, are three bifurcated snags, two vertical, and the third bent forwards; at the extremity are two simple, both pointing forwards; but what seems to confer a decisive character on these horns is, that beneath these, on the inferior edge of the beam, a sixth heavy snag hangs down perpendicularly, widened and flattened at the base, and evidently much worn by friction, while the animal grases: this is the character on the left; the right is similar, excepting the extreme points which appear to have been injured in the development. In the British Museum, there is another similar pair with the worn clavate suspensal snags, but less in proportion *. These two specimens seemed to justify the appellation of *Cervus Clavatus* for a new species, but the comparison of several others in the British Museum, evidently of the same character as figures 8, 9, 23, of plate v. before cited, would leave a doubt did any one exhibit the inferior clavate snag. Fig. 16 indeed has something of the kind, but comparing the two figures their resemblance is very remote, though it might possibly be of a young specimen of this supposed

* The notes of dimensions being mislaid, I cannot give them exactly, but the proportions of the drawing offer about two feet to each horn measuring along the curve, and about three feet six inches from tip to tip, in a line to the extremities.

species*. The above specific denomination may therefore be still proposed, and as we have shewn, there are in this article, perhaps, altogether three species indicated; or we must assume, that the Virginian or Mazame group, although it consist of one species only, has, nevertheless, a most extensive variety of forms in the very parts of the horns where specifical distinctions are allowed to reside.

Great-eared Deer. (Cervus Macrotis.) This animal which may be the younger state of one of the preceding, is described by Dr. Say, as light reddish-brown above; the sides of the nose and upper portion of the forepart of the nose dull cinereous; the back intermixed with blackish tipped hairs, which form a distinct line on the neck near the head; tail reddish-cinereous black at tip; this part is somewhat compressed, and almost naked beneath: the hoofs are shorter and wider than those of the Virginian Deer, and more like those of the Wapiti; the horns slightly grooved and tuberculated at base, with a similar antler as in the Virginian; the beam less curved forwards, is bifurcated equally at about seven inches from the burr, and each bifurcation near the summit again divided, the anterior of the second bifurcation being somewhat longer than the posterior; the ears very long, extend to the principal bifurcation, about half the length of the whole horn; the lateral incisor teeth are larger in proportion to the intermediate than in the Virginian; eye-lashes black; lachrymal apertures also larger, and the hair coarser, and undulated and compressed like that of the Wapiti†. The species is

* When my drawings were made, I had no knowledge of the method adopted in the *Ossemens Fossiles*, or I would have designed my figures in a similar point of view.

† This account taken from Dr. Harlan's *Fauna Americana*, says Elk in this citation, but as that word is by him applied to Wapiti, we presume it is the animal here meant. It is to be regretted that the accurate Dr. Say has not published figures of the horns.

found in the most remote north-western territories of the United States, and from the context of this description it appears evident, that the Guazupuco Deer is nearest allied to it, and that the Guazuti and the Virginian are clearly of the same group.

Long-tailed Deer. (Cervus Macrourus.) Also named Black-tailed Deer, and deer with a large tail, from the peculiar large size and contrasted colours of that organ. This animal is described in Le Raye's MS. Journal, as larger than the Red-deer, of a darker colour, with a white belly; the horns short, small, somewhat flattened; the tail nearly eighteen inches long, black above, with broad white edges, and held up erect while running. It abounds about the Kansas river in Central North America.

Guazupuco Deer. (Cervus Paludosus.) This animal is described by M. D'Azara as having horns rather large and cylindrical, terminated by a fork, with an anterior antler some way up the beam, simple or bifurcated, pointing forwards, and then vertical; his muzzle is large, figured like that of an ox; the eyes large and full, with a lachrymal fold beneath; the forehead below the horns flat; the ears terminating in a point; the pedicles of the horns are one inch high, and the horns about one foot four inches in length, with never more than five snags; mammæ four, disposed in a quadrangle; the eye-lashes black, surrounded with white, which passes on the side of the face, and surrounds the muzzle and mouth; a black velvety spot in the angle of the lower lip, another facing the nose on the upper; a black triangular one on the nose, and another between the eyes, united by a dark line between them. Inside of the ears, under-jaw, and cheek, white; a black spot on the interval of the hoofs of all the feet, ascending to the second joint; a black band passing along the breast, and on the under (upper) part of the tail. In size this animal is at least equal to the Stag of Europe, being four feet at the shoul-

C. Hamilton Smith Esq.
delt from Life.

GUAZUPUCO DEER.

C. PALUDOSUS. Desm.

ders, and four feet four inches at the croup; the general colour of the neck, back, shoulders, and rump, is reddish-bay; the tail is middle-sized, and the teeth have the intermediate incisors large.

The females are less than the Buck, without black on the breast; the fawns are without livery or spots, being of an uniform dun colour: albinism is not uncommon in the species. The colours of the fur do not change with the seasons, nor do the horns drop at fixed periods, individuals having been found with theirs in full growth, while others were without. This assertion of M. D'Azara is singular, for it would imply that the rutting period is likewise undetermined, and this must nevertheless be in harmony with the time of parturition in the Does, which in its turn cannot be during the inundations caused by the rainy season, nor even immediately after, because they inhabit the swampy regions of South America, particularly of Paraguay, where they reside among the shrubs and bushes, where the amomiæ or bastard ginger abound.

A living specimen shewn in London evidently belonged to this species. It was somewhat less than the stature here given; the muzzle was not unusually broad, though very conspicuous, and the markings on the face, cheeks, and feet, similar: the horns checked, most likely in their growth during the sea-voyage, stood rather approximating, and were reclined and bent outwards, with a small antler a short way up the beam; from hence their direction, though rather irregular, was chiefly with the concave parts to the front and side. One had three terminal snags, the other only a fork: but the principal difference arose from a great quantity of long silvery hair on the lower abdomen, extending from the prepuce between the thighs, and passing up the root of the tail, and from thence lining each side of it to the point: as the animal carried it erect, this long white fringe gave him a very singular appearance he was

judged to be four years old, rising five. We have seen that the Virginian Deer sometimes has a similar white and long fur on the belly, and therefore no character of importance belongs to it. It were to be wished that we could have determined exactly from what part of South America he had been brought, but think it was Pernambuco: it is probably the Badgew, or more correctly Gadgew, of the Surinam Negroes; and we think that the large palmed horns before described might belong to a variety of this species residing far to the south.

The *Guazuti Deer (Cervus Campestris)* likewise first described by M. D'Azara. This species is considerably less than the former, being only about two feet six inches at the shoulder, and two feet eight and a half at the croup; the horns are a foot long, slender, with the beam suberect, a branch anteriorly placed, bent upwards, and posteriorly one or two snags towards the summit; the eyes are large and brown, with a suborbital fold; the ears erect and pointed; the fur smooth and close, is reddish-bay, the hair, being reddish-bay at the point, and dull brown at the base; the inferior parts of the body, the under side of the head and tail, which measures six inches, are white, as also the hinder part of the buttocks, and internal face of the thighs, a circle round the eyes and inside of the ears; the hair on the lower abdomen and between the thighs long.

A specimen at Exeter 'Change shewn under the name of *Cushew* (Couassou), the vulgar pronunciation of Guazu, somewhat taller than D'Azara's, agreed in all respects with his description, excepting that the long hair on the belly was wanting, and that part and inside of the thighs were of an ashy colour; the tail was black. The smell of onions with which they are infested was not observed, it arises probably from feeding on bulbs of that plant in its native country, and vanishes when other vegetables are substituted; the fawns are spotted with white. M. D'Azara says that

C. Hamilton Smith Esqr
del. from Life

SWAZUTI DEER.

C. CAMPESTRIS. Ejus.

white specimens are not uncommon. This species resides in the open plains, and not in swampy woods, like the preceding. It is very fleet, and in the heat of its course the male emits a powerful smell of onions, which is perceptible at four hundred yards' distance. M. Desmarets states that he received a horn, which he considers of this species, brought from Port Desire, on the coast of Patagonia. Hence it would appear that they spread nearly over all South America; but these horns, according to Baron Cuvier, become flattened and prismatic in form, with a second snag to the rear below, and one (fig. 48, pl. 3, vol. iv. *Oss. Foss.*) brought from the south of Brazil, had several snags upon each fork, approaching, in a diminutive form, to those before described under the head of *C. Mexicanus*. It is, perhaps, proper to remark, in support of what was before said on the flattening of Deer's horns, that this occurs again in a specimen where the latitude is subject to snow.

The *Cariacou Deer. (Cervus Nemoralis*, Nob.) This little animal appears to be the last of this group, and the smallest of the species or varieties of Virginian Deer. It exists principally in the woody regions of tropical America, and, as it would seem, as far north as the southern parts of the United States. The Baron figures a series of the horns, fig. 18, 19, 20, 21, 22, and 23, of plate v., under the names of *Cariacou, Biche de la Louisiane, Biche de Cayenne, Cerf Blanc, Cerf des Paletuviers*, &c. We consider it as the Squinaton of Dobbs; and it may be even the Jumping Deer of the Canadian Voyageurs, but there must be some error in Mr. Warden's dimensions of the horns, which are given as two feet long. In the United States the name of American Roebuck is bestowed on it, and, in truth, there is much resemblance in the two animals. We had an opportunity of drawing both sexes from a male and two females, kept in the gardens of the Hospital at New York, where we were informed that they came from Virginia.

They were certainly very different in figure and markings from the preceding; the horns not more than eight inches long, somewhat vertical, rugous at base, with a small antler not above an inch in height, rising vertically at a short distance up the anterior part of the beam, which at the insertion of the antler, bent back, and then, being slightly flattened, turned inwards and forwards in a slightly uncinated bend, throwing off a posterior short snag, which constituted a bifurcation; the Buck and Does were nearly of the same size and colours; the head rather round, not so prolonged as in Guasuti, and the body longer than the Roebuck, about twenty-eight inches high at the shoulders, and thirty at the croup; the neck, shoulders, sides, and back, were of a yellowish-brown gray; the inferior part of the belly, edge of the buttocks, and under tail, white; the face darker brown-gray, leaving the region round the nose, lips, and chin, likewise white, with a black spot on the nose, one at each side of the mouth on the upper lip, and one at the corner of the lower lip; the space round the orbits and cheeks, dun, with a little whitish-fawn behind the eye; the ears moderately long and pointed were brown-gray outside and whitish-gray inside; the eyes full, dark, and soft, with a small suborbital fold beneath; the muzzle small, round, and black: from the knees downward to the fetlock was a dark streak, but the rest of the limbs ochery; and the tail, about four inches long, was dusky above, without any long white hair at the edges*.

While engaged in making the sketch, they were fed with bread, and the Buck jealous of the Does sharing the dainty, shewed his propensity to leap, for he drove them off by butting them, the head turned sideways, not unlike a goat in

* A female which we had occasion to observe daily for a long time in a domestic state, at Spanish Town, Jamaica, came from Honduras, and was in every respect similar to the above. It would steal bread from the table of Sir George Nugent, the Governor.

play, rising for the purpose high upon his hind-legs, and not by running with the head low like the Stag. It being in the month of March, their mewing period, he broke one horn off in this sport, and then made several surprising vertical bounds, but only one drop of blood escaped from his head, and he stole away in a crouching gait under a shed*.

As we are inclined to consider the Cariacou a species, we have ventured to propose a trivial name expressive of his haunts; but whatever be the ultimate determination respecting the species or varieties to be reckoned in the Virginian group, this series shews how much we have to learn respecting the Deer of America. The immense means of comparison now in, and daily arriving at, the Museum of Paris, indeed may, in time, under the hands of the illustrious brothers, clear up the subject; but we cannot but express a wish that the Academies of Natural Sciences of Philadelphia and of New York, should do that for Zoology, which, from their zeal and favourable position, naturalists have reason to expect.

The Subulonine Group.

Although the specific discrimination of the Deer in general is sufficiently intricate, none, perhaps, have been involved in greater obscurity than the group which we shall denominate Brockets (Subulones), now under consideration. From the circumstance of the females being more numerous than the males, an opinion was long entertained that there were Deer in South America who had no horns; and this notion induced artificial classifiers, without further inquiry, to lend females and fawns of real deer to the genus *Moschus:* then as the bucks of this group never bear other than prickets or single dags on the head, it was inferred,

* M. Bajon, *Histoire de Cayenne*, asserts that the fawn of the Cariacou is spotted with white; but there is much confusion in the Cayenne description of the Deer.

indeed, from analysis, with fair probability, that they were specimens with their prickets or first horns, and, therefore, not adults. This second question, when it began to be cleared up, involved the difficulty of distinguishing those who in reality never bear antlered horns, or the true Subulones from the young males, who are so only temporarily, and bear antlered horns at a later period; and next of indicating what number of species might be distinctly characterized. Some of these desiderata are not as yet satisfactorily determined, although some species, have been long observed in Guiana and at Honduras, where we have seen them many years ago. M. D'Azara first gave a distinct description of them. The Subulonine group is clearly distinguished by the simplicity of their horns, they being destitute of branches or processes at every age. They are of middling and below the middling stature; their nose is pointed, with a small muzzle extending at the side of the nostrils into a glandular termination; they have a small lachrymary sinus, and are of uniform colours, in which the bright rufous predominates. In their manners they are polygamous, and prefer swampy woods to the open plains. In the Brazilian, Guarani, and Tapuia dialects, these, together with all the lightfooted Ruminants, whether Deer or not, are distinguished by the generic name of Guazu, from whence the French have derived the word Couaesou: but these nations invariably add an adjective or a trivial appellation to it. We have adopted the term Subulo or Brocket, to distinguish this group from the others: the word itself designating, in the technical phraseology of the chase, the Stag with his first or simple horns.

The *Pita Brocket. (Cervus Rufus.)* The Buck of the Guazu Pita of the Brazilians, is about four feet long, two feet seven high at the shoulders, and three feet at the croup, and, therefore, stands higher than the Roebuck. The head is very pointed, with a small muzzle extending at the

THE PITA BROCKET.

CERVUS RUFUS.—F. Cuvier.

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THE AXIS.

CERVUS AXIS. Erxleb.

London Published by J. S. Wheeler Aug. 1 1830

side of the nostrils so as to widen this part into a glandulous appearance: there is a suborbital sinus before the eye, and the male has canines; the horns are always simple with a small burr at base, and the pricket about five inches long; the body is of a lively reddish-bay, excepting the face and feet, which are red-brown; the lips, chin, surface between the under jaws, under part of the tail, and lower abdomen, are white; the throat and internal face of the thighs whitish-gray; the tail with the hair is nearly nine inches long, and red-bay above; a circle round the eyes is occasionally paler than the rest of the head: the females have the same colours, but are smaller in stature. The species resides in the deep forests of the level parts of eastern South America, along the bay of Honduras, and the neighbouring countries: they live in large herds, and appear to be the only gregarious ruminants known who do not prefer the plain.

The *Apara Brocket. (Cervus Simplicicornis.* Nob.) There is a second species of red Pricket-deer very like the foregoing, but six inches lower at the shoulder, and it is believed destitute of canines. The colours are the same, but brighter, the tail shorter, and the hair upon it longer; round the eyes there is a ring of darkish colour, and a dusky mark on the mouth. Baron Cuvier *(Oss. Fossiles)* first indicated it as a separate species, and Laborde seems to point it out in his second or smaller *Biche des Bois*, the above being designated by him as the *Biche de Barrallou.* This appears to be the species in the Museum of Prince Maxmilian of Nuied, to whose politeness we owe the drawing of both sexes. Messrs. St. Hilaire and Lalande have likewise brought a specimen from Brazil. There is also little doubt that so early as the time of Marcgrave and Piso, who were both in the suit of Prince John of Nassau during his campaigns in northern Brazil, this species was observed by them under the name of Cuguazu Apara; but,

having omitted to give a figure, and substituted instead one of the Stag of Europe, naturalists were unable to comprehend them. Fortunately the original collection of the drawings made by the Prince of Nassau, or by his orders, with MS. notes in his hand, and in that of both the above naturalists, is still in the Berlin Library, and there we find a good representation of the female in a nearly adult state. The colours are the same, excepting that the ears are nearly transparent, and the head and neck dark ashy, with a little white on the throat. This ashy tone we found still about the eyes of the adults, and we infer that this colour disappears from the head and neck when the animal is full grown. It is probable that this species resides more in the uplands, and in more open ground*.

The *Bira Brocket. (Cervus Nemorivagus.)* This species has been confounded with the preceding, though it is still smaller, being only eighteen inches at the shoulder, and the aspect and colours of the animal are very different. Azara describes it as having the head more like a lamb; the tip of the ear is rather round, lachrymary sinus very small; the horns straight, reclined, smooth, solid, and pointed, having a diameter of seven lines, and one or two inches in length; the coat is of a gray-brown, the hair being brown with yellowish-white points; some white on the breast, lips, and chin; the belly, interior as well as anterior and posterior part of the fore-legs, and the whole from the knee to the hoof, and a space round the eyes, of a buff-coloured

* Professor Lichenstein, to whose kindness I owe the facilities I enjoyed of drawing and copying zoological subjects both in the Berlin Museum and from the above-quoted collection, regarded the Gouzouapara and the figure as of the female of Azara's Gouazouti, *C. Campestris;* but the Paris and Prince Maximilian's specimens prove the mistake. See his paper in the *Berlin Transactions*, 1815. *Die Werke von Piso und Markgrave über die Natur Geschichte Brasiliens erläuter, &c.*

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THE BIRA ROE.

C. NEMORIVAGUS. F. Cuv.

white; the exterior side of the thighs and hind-legs fawn colour. We have not seen this species in the Museum of Paris, excepting, perhaps, the head; but there is a fine one in the Museum of Frankfort-on-the-Mayne, sent there from Brazil: the colouring corresponds, excepting that the tone on the back is more yellow. The proportions of the specimen are heavier than in the two former, the legs being shorter and stronger, and the body more compact. A remarkable character is observable in the shape of the fore-arm (radius), which appears to be convex or bent forwards, with the *olecranon* far back, so as to make that part of the limb unusually broad; upon the outer face of it there is only a stripe of brown-gray colour, the rest being nearly white. The bones of the extremities being preserved in the skin, and Professor Grätzmer having assured us that the same form obtains in other specimens, it is probable that it forms a character, and the more so as this formation explains the compacter form of the animal. That learned professor had bestowed the name of Simplicicornis upon this animal; but as M. F. Cuvier had already appropriated that specific name, we have transferred the professor's to the former species, where it is equally appropriate. According to D'Azara the female produces two fawns with spotted livery, and its manners are solitary in the woods.

The Stylocerine Group.

The last group of the genus *Cervus* consists of those who have high pedunculated horns; they all appear to belong to the continent and islands of the Indian Ocean, and to attain but a small stature. The males have long canines in the upper jaw, which protrude beyond the lips, a muzzle, and a deep suborbital sinus; but their most obvious character resides in the elevated pedicles upon which the horns are fixed, the root of which descends in prolonged ridges to near the nose. In the females, who are always

destitute of horns, this character is replaced by two bristly, broad, and dark spots above the eyes resembling eyebrows; or by a coarse dark patch of hair, like a mask or chaffron, which covers the forehead, and descends on the nose, and also retains the brow-like, bristly terminations over the eyes. Mr. Pennant's Rib-faced Deer, or Muntjak, with two antlers upon each horn, appears still unknown; for all the specimens at present in the Cabinets of Europe have only one or none, and the beam terminates in a simple uncinated point without bifurcation: it is probable that this supposed character has arisen from some inaccuracy of expression or of the press. The females have four teats in a quadrangular position. The tongue of these animals is extremely long, so that they can extend it even beyond the eyes, a conformation which they have in common with the Musks, who often lick their eyelids. None of this group appear to shed their horns more than once, the first pricket being replaced by a permanent horn with a small anterior basal antler. The fawns are chestnut-coloured, with numerous white spots, if we may judge of the whole by one brought from Sumatra, and another said to be from Ceylon.

The *Kijang*. (*Cervus Muntjak*.) This species appears to be the *Cervus Vaginalis* of Boddaert, and the *Chevreuil des Indes* of Allaman. The male is smaller than the Roebuck, and of an elegant form. The body is compact, the legs remarkably fine and slender; the muzzle is rather broad, and the canines assume the form of inverted tusks, sharp at their posterior edge, and hanging out of the mouth with their points turned towards the animal and outwards. Two rib-like eminences ascend from above the nose over the eyes, and elevating themselves from the head in the form of slender pedestals to the height of two and a half inches, terminate in a flattened summit. Upon these the horns are placed, about three or four

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SUMATRA MUNTJAK.

? MUNTJAK—*Sumatrensis*. ?

C. Hamilton Smith Esq. del.

Paris Mus.

London Published by S. Whittaker Sep. 1. 1826.

inches long, uncinated at top with the points turned inwards, and with a small branch at base pointing forwards: between the ribs, the skin of the face is doubled into a fold, which has the appearance of a third or central rib. The fur is fine and close, of a grayish-brown, paler beneath; the breast, inside and anterior face of the thighs are whitish; the tail is short, dark above and white below. Dr. Horsfield's figure of this animal displays a similar distribution of colours; and his specimen shewing the summit of the pedicles widened in the form of a rose (which is a sign of age), we presume to be that of an old buck.

In the collection of Mr. Bullock there was a female which may be referred to this species from the general resemblance and the colours of the fur. It was about two feet high at the shoulder and three feet six inches long. The head above the orbits was square, and the nose tapering to a small muzzle; the body rather heavy and the legs remarkably delicate; the lachrymary sinus long and very distinct; the head, neck, back, shoulders, thighs, and legs, were dun-gray or a brown and buff intermixed; the hair white at base, close and fine; the lips, throat, breast, belly, and inside of the thighs, white; the ears rather narrow, middle-sized, dusky outside and white within; the tail about three inches and a half long, of the colour of the back; but on the face there was a mark, which we have not noticed in any other female Muntjak: it formed a kind of mask, pointed on the forehead, and tapering down towards the nose, the sides spreading above the orbits, where they ended in a bristly and curling kind of eyebrow. The hair of this part was dark, and harder than the rest; the posterior part of the legs were paler, and the hoofs very small and short. It was an adult, and had been pregnant, for the mammæ, disposed in a quadrangle rather close together, protruded much, and were of a pale rose colour.

These we take for the old specimens of Java, but it appears, also, that there are others of a bright fulvous-brown in the same island, which would cause a suspicion that there is a second species or a variety; but it may be, that these animals change their colours with the monsoons, or what is still more probable, that they are young specimens. In confirmation of this supposition it may be remarked, that the fawns are fulvous-brown, with small white spots, which spots soon disappear; that the young males, distinguishable by their long slender pedicles, have the whitish parts under the throat, breast, and round the lower abdomen more reddish than those which are further advanced in age, when the white becomes more pure as the pedicles shorten and widen at the summit; it spreads also by degrees round the mouth, under the jaw on the throat and breast, and down the internal surface of the thighs. It may therefore be conjectured, that the white part of the hair, which it is invariably at the base, ascends to the surface, and effaces more or less of the fulvous, and constitutes, in reality, a sign of old age: the comparison of above a dozen specimens seem to warrant the opinion.

The individuals sent from Sumatra to Paris are, in truth, all fulvous, and Sir T. S. Raffles describes his Sumatran Kijang with the same colours, the white being visible on the chin, breast, lower abdomen, inside and anterior part of the thigh, and under part of the tail. A female in the Paris Museum, marked from Ceylon, and a male certainly adult, are fulvous; although the pedicle is still long, it is not flattened at the summit, and the horns were in their growing state, the velvet being still upon them. If the opinion of Sir T. S. Raffles respecting their changing horns only once, or at least very rarely, be correct, we may conclude that this also is a young animal. The skull in Surgeons' College, from which Dr. Blainville drew his characters of *Cervus Moschatus* is of a young male with the

first horns: but a specimen at Paris without horns, of the same fulvous colours as the others, and said to be from Java, shews a particularity not observed in others; namely, a small brush of stiff and long hairs on the outside of the back of the ears, facing the posterior part of the pedicles. In this individual the tusks are double, and the head is smaller and narrower than in the preceding: as the pedicles are above three inches long, it may be conjectured that the individual was killed just after shedding the prickets*.

The manners of these animals are as yet very imperfectly known, they seem, however, to reside in the woods in pairs, or small families: when domesticated they are very gentle and familiar.

The *Philippine Muntjak. (Cervus Philippinus.)* If the former specimens may be all referred to one species, the present has characters which leave no doubt of its being different. The specimen in the Paris Museum, brought from the Philippine Islands, is somewhat larger than the above. The horns are wanting, but the pedicles are not above a quarter of the length of the head, and more bulky than in the Rijang; the ribs extend downwards only to between the eyes; the face is plane, the forehead slightly arched. There is a dark streak on the anterior base of the pedicles, and between them the hair is black, forming a spot with the point downwards; on the nose another dark spot turns its point upwards, and leaves a crescent of a dirty buff between them: this colour spreads round the orbits and on the cheeks; the lachrymary sinus is dark;

* In Mr. Marsden's figure there is the same character of youth; but in the Banksian collection are two views of a head by Dr. Forster, where the short obtuse form of the pedicles, and the length of the horns shew age. In these figures the eyes are surrounded with long scattered hairs, and there are similar hairs on the chin: he names it *Cervus Plicatus.*

the ears rather short and obtuse, whitish within, dull buff outside; the colour of the coat is wholly brown sepia-gray, clearer on the throat and darkest on the neck and legs; the tail is three inches long, black above, and white beneath.

The horns being absent, this most essential point remains undetermined; but the Baron conjectures that a small skull, with very short pedicles, and, nevertheless, supporting horns nearly as long as those of the Kijang, with a distinct burr, and a small anterior antler turning inwards, might belong to this species.

Blainville's Muntjak. (Cervus Subcornutus.) This species was established by Dr. de Blainville, from a skull in Surgeons' College, London. The horns resemble those of the Sumatra specimens, but smaller, with a regular burr, a small process in front, and the point of the beam turned back, and not towards its opposite horn; the pedicles are short, strong, very prominent, but not much prolonged on the face, and no canines are seen in the maxillæ. We omitted to draw this specimen, but believe it much smaller than the Kijang, and feel inclined to consider it as belonging to the Philippine.

The *Ubi Muntjak? (Cervus Aureus*, Nob.) In Mr. Bullock's collection we found another stuffed specimen of a female, which at first sight might be taken for an antelope, but the supercillious spots of dark strong hair, and square forehead, leave no doubt of its affinity to Muntjak. It was three feet four inches in length, with slender elegant formed legs, in height about two feet to the shoulder; the head was seven inches long, the nose tapering, and the muzzle not black; above each eye a streak of strong reclining glossy brown hair; the lachrymary opening large; the eyes rather nearer the muzzle than in the former; the tail four inches long, formed a black tuft; the ears were broad, somewhat naked within, and four inches long; the shoulders, back,

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FEMALE OR MUNTJAK?

CERVUS AUREUS. Hamilton Smith.

NEPAUL MUNTJAC.

C. MUSIMATUS.—Hamilton Smith.

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and rump, were of a bright fulvous-yellow; the neck and face not so brilliant; the nose dun; the throat, belly, inside of the limbs, and fetlocks, pure white; the external side of the legs buff; the hoofs black, small, and pointed; forming altogether the most beautiful creature of the whole species. Its native country was unknown, but we recollect that a deer, termed at Exeter 'Change the Golden Deer, with bright yellow horns, was once brought there from some part of India; it was soon removed, being presented to some private person. We would refer this female, though with great hesitation, to Sir T. S. Raffles's Rusa Ubi, noticed in his account of the Rusa, *Lin. Transactions*, vol. xiii., which, according to the natives of Malacca, is of a reddish colour, with unbranched horns, covered with hair to within a short distance of the point. It it also called Rusa Saput. The colours described by ignorant natives in a different language, are not a sufficient reason to reject the supposition: certain it is that the Malacca animal here mentioned must belong to the group of Muntjaks.

The *Nepaul Muntjak. (Cervus Moschatus.)* In the *Oriental Collections*, for January, &c., 1798, vol. ii., Sir William Ousley figures an animal under then ame of Musk-deer of Nepaul, from a drawing executed by a native artist, with the following dimensions, communicated by Colonel Ironside:—Length from between the ears to tail two feet four inches; height two feet; length of head seven inches; of the tail six inches and three quarters; of the tusks two inches and one-eighth; the hair bristly and thick, two inches long. By the illuminated plate, the animal must be entirely dull fawn colour, with the superior part of the tail alone dark; the horns placed upon high pedicles are dark, simple, without branches, and pointing to the rear; the limbs are very slender; the spurious hoofs small; the neck rather short. The habitat and character of the

hair, render it probable that it is a distinct species; and although no reason is assigned for the name of Musk-deer, that being the designation of the natives, render it probable that it is impregnated with a musky smell. The skull designated as *Cervus Moschatus*, by M. de Blainville, may belong to this species.

The GIRAFFA. *(Camelopardalis Giraffa.)*

We are now to consider an animal of so extraordinary a form and lofty stature, that even the stuffed spoils, the almost shapeless representative of the living creature, produce upon the eye of the beholder a mixed effect of awe and astonishment. Our imagination is involuntarily led back to the early epochs of the world, when colossal beings peopled the earth, and were the undisputed possessors of every region: we fancy ourselves in the presence of one of the survivors of the great diluvian catastrophe, when the Mastodon, the Megatherium, and, perhaps, its own congeners, were swept away, to leave this one species, among a few others, to attest what were the forms of a primitive animated nature. The Giraffa stands isolated among the ruminating animals in family, genus, and even in species; its characters offer a mixture of several genera, among which the quinary system may select whether to class it with Illiger among Cameline, or with other naturalists among Cervine or Antilopine animals. By the length of the neck, the callosities on the sternum and knees, and by the want of spurious hoofs, it assimilates with camels; and so obvious is this approximation by the addition of stature, that it did not escape the notice of the ancients: but the pedunculated form of the frontal processes, in the shape of horns, recall that character in the Styloceri or Muntjak Deer; while the stiff hairs which crown their summits seem to want only the gluten to cement them into true horns, and embody it, in systematic arrangement, with the *Cavicornia*.

This affinity is indeed maintained by other characters, such as the elevation of the anterior extremities, and of the spinal processes of the shoulders, and the corresponding depression of the posterior quarters, which seems to connect it, through Bubalis, with the Acronotine group of our proposed genus *Damalis*. The similitude of conformation is further perceived in the general shape of the head, the ears, the eyes, the body, and the tail; yet the Giraffa is possessed of characters exclusively its own, for beside the bony processes covered with skin, and surmounted with strong bristly hairs, there is a spherical elevation on the forehead, elongated towards the nose; the nose and lips resemble that part in a horse, and the colour of the coat is dirty-white, marked with large, approximating, angular, and somewhat regular blotches of a dark-brown or rufous colour; from the back of the head to the end of the shoulders a short erect mane passes down the neck, marked by alternate spaces of black and white. From a comparison of these characters, the Giraffa appears most naturally placed immediately after the Muntjaks, and before the leading *Cavicornia*, or that family of ruminants which is distinguished from all the preceding by the possession of true horns.

The name of Giraffa is derived from the Arabic Zuraphahta, which is itself corrupted from Amharir Zirataka; and the Romans who had seen this animal several times exhibited from the period of Cæsar, described it under the name of Camelopardalis, on account of its similarity to the Camel in form, and to the Panther or Pardalis in spots. Pliny, Ælian, and Strabo, have noticed the animal, but the first satisfactory description is found in the *Æthiopica* of Heliodorus, Bishop of Tricca. "The embassadors," he says, "of the Axeomitæ (Abyssinia,) brought presents to Hydaspes, and among other things, there was an animal of a strange and wonderful species, about the size of a camel, which had its skin marked with florid spots; the hinder

parts from the loins were low, like those of a lion, but the shoulders, fore-feet, and breast were elevated above proportion to the other parts; the neck was small and lengthened out from its large body, like that of a swan; the head in form resembled a camel's, but was in size about twice that of a Lybian ostrich, and it rolled the eyes, which had a film over them, very frightfully. It differed in gait from every other land or water animal, and waddled in a remarkable manner; each leg did not move alternately, but those on the right side moved together, independently of the other, and those on the left in the same manner, so that each side was alternately elevated. This animal was so tractable as to be led by a small string fastened to the head, and the keeper could conduct it wherever he pleased, as if with the strongest chain. When it appeared it struck the whole multitude with terror, and it took its name from the principal parts of its body, being called by the people, extempore, Camelopardalis."

The Giraffa in an adult state is reported to be sometimes nearly twenty feet high from the summit of the head to the sole of the foot. Among a dozen specimens which we have seen, Mr. Burchell's male, in the British Museum, is the tallest, and measures seventeen feet six inches; the rest did not exceed sixteen feet. The head is about two feet six inches long; the height from the shoulder to the ground ten feet nine inches, and from the breast to the ground near six feet; the hornlike processes eight inches long; height of the croup above nine feet; and the tail, including the tuft, near five feet. The females are smaller than the males, and have four inguinal mammæ; they are said to be gravid a twelvemonth, and to produce only one calf at a birth. This at first is spotted like the mother, with rufous marks, which darken, if it be a male, to deep brown. In the teeth of this animal the external incisors have a bilobate form. It is gentle in disposition, and might be easily rendered domestic, and extremely useful to traverse

the deserts of South Africa, and supply the place of the Ashaarys, or the fast-going Camels of the north.

The Giraffas live in small families of seven, eight, or even fifteen, on the plains of the interior, and principally on the great Southern Sahara, where there is herbage or succulent vegetation; but this, from their great height and the comparative dimensions of the neck and limbs, must be inconvenient to gather, and it is known that the Canaap Kameeldoorn, or Mimosa Camelopardalis in particular, is their favourite food. They amble in gait, with the head stretched forward, and are not remarkably fleet, notwithstanding their length of limb. From the great elevation of the head, no use can be made of their hornlike processes for defence, but they kick and strike with prodigious force. It is asserted that the Lion seldom preys upon the Giraffa, because the hardness of the hide is so great that he cannot tear it, even when he has sprung upon their backs; and that he is sometimes carried a great way, and at length thrown off without effecting his purpose.

Modern Naturalists have known the Giraffa only since Mr. Patterson, Colonel Gordon, and M. Le Vaillion found it in South Africa; but as the Romans were acquainted with the animal, it must have existed in the north of the equinoctial line. It would appear, moreover, that a variety or second species is found in Central Africa, for Mr. M. Park, in describing his escape from captivity among the Moors, noticed an animal of a gray colour, which he refers to the Camelopardalis; and although it was seen by him passing, the form cannot well be mistaken for any other creature. We would consider this animal as the Wild Camel of the mountains, the existence of which we have had attested by several Negroes who had been brought from the interior; and in the Prænestine Mosaics, where two spotted Camelopardales are seen together, a larger animal is likewise represented with short horns, but without spots, and

the name TABOTC written over. In a drawing of the same Mosaic, the word appears to be partly effaced, but to have been PAΦOTC. It is remarkable that while the spotted figures are without a name, the animal in question, occupying that part of the picture which designates the Cataracts of the Nile, should be called by the Æthiopian appellation, which, according to Pliny, was Nabis, resembling the Hottentot Naip; or by the second reading be like the Arabic, or one of its dialects*.

The Cavicornian Family.

The ruminants which constitute the remainder of the order, seem to be all constructed after one model, their osteological characters differing only in proportion, or in the greater or less development of parts. The males of the whole, and the females of most of the species, are provided with real horns; that is, with osseous prolongations from the frontals, covered with a horny substance, not deciduous nor growing out from the extremity, but receiving their increase at the base. Although the number of species is very considerable, it is difficult to assign sufficient characters to divide them by distinct and permanent indications. They may be viewed as forming one great family divisible into two tribes, the Caprine and Bovine; but it cannot be concealed, that this division, certainly convenient, is, nevertheless, arbitrary in its limits, for the

* The Negroes who asserted that there is a wild camel in Central Africa, agreed in the colour being ashy, and in the animal having horns and tusks: they represented it to be very large and fierce, but none had been near one. The Prænestine Mosaic is said to be of the time of Marius; but what appears better proved is that Egyptian Greeks were the artists employed to make this kind of work even in Italy and Spain, as is evident from the birds, fish, &c., figured. In the fragments of a Mosaic at Avenches (Aventicum), in Switzerland, the Mormyrus Oxyrynchus of the Nile, cannot be mistaken.

passage from one to the other leaves a doubt where that limit should be fixed. Nature, however, shews the same difficulty wherever the species allied have been studied in sufficient numbers. Neither artificial nor natural characters enable us to mark the links of the chain, or rather the knots in the web, by which every kind of animated being is connected with others in a greater or less degree of affinity. We shall find, in the following pages, the ruminants subjected to the same laws which obtain in other orders; namely, to undergo a sort of cycle of all the variations of subordinate characters consistent with their typical plan; the last of a series resuming some of the distinctions of the first, and both possessing others which connect them with the preceding or succeeding genera.

The Caprine Tribe.

Both the artificial and natural systems agree in placing at the head of the family, those animals which retain the forms of Deer, with the true attributes of their own section, and, consequently, the genus *Antilope* precedes the others. But before we enter upon our view of the subject, it may be proper to make some preliminary reflections. By the common consent of naturalists, the extensive tribe of Caprine animals is composed of species extremely different in shape and size, but linked together by a constant succession and interchange of subordinate characters. A fanciful theory might view the numerous species connected by this sort of consanguinity, as resulting from several types originally endowed with the faculty of procreating, by their intermixture, subordinate prolific races, which in their turn became the types of species and even of groups. Buffon clothes a theory of this kind with the gaudy colours of his brilliant imagination: two distinct species appear to him as descended from a third; one bearing the impress of the male, the other of the female predominance of characters

observable in the original parent species, and constituting two new lines of a spurious genealogy. But although it is asserted and believed that the Goat and Sheep produce an intermediate prolific race, comparative anatomy and continued observation have gradually reduced these speculations to very restricted limits. Where the number of species is very considerable, and the characters by which genera and racemi can be divided, are so insignificant and evanescent as the flexures of the horns, inguinal pores, &c., varying and interchanging in a manner that might almost appear capricious, the difficulties of a systematic arrangement in a natural order are great, and appear surmountable only by degrees, as our knowledge extends over additional species, and we clear away the confusion produced chiefly by an injudicious application of all the known names and partial indications of travellers, to the very few species first described by Buffon, Pennant, and Pallas.

Linnæus, who was acquainted with few animals now usually classed with *Antilope*, seems to have been led by the observation of Pliny, that "goats assume many forms, &c., including Oryges, Damæ, Pygargæ, Stresicerotes, and many others;" and, therefore, instituted but one genus, *Capra*, for the whole, excepting the Sheep, which he kept separate, without a distinctive character more prominent than many of those which he threw together in the Goats. Buffon, notwithstanding his generalizing principles which converted species into mere varieties, opposed artificial, and even natural classification to the extent of regarding, on some occasions, the absolute integrity alone of specific isolation; and then seeing no greater degree of affinity between the small and the larger species, than he found between the Ox and the Sheep. But with the increasing number of species, Pallas first perceived the propriety of separating certain animals from the Goats, and instituting a new genus, founded principally upon the round, annu-

lated, and often spiral character of the horns. To designate the new genus, he applied generically the English word antelope, which, since the time of Ray, was appropriated to the common or Cervicapra species, although long known in the list of fabulous beings, which heralds are supposed to have invented for the purposes of their art, but which, in this instance, was intended to designate a true antelope of the Orygine group. The earliest indication of this kind, in English heraldry, is, we believe, among the cognizances of the Plantagenet branches, issuing from King Edward III., about the close of the fourteenth century. The Antelope was a symbol of an honour held by the house of Lancaster. John of Lancaster, the great Duke of Bedford, bore his arms supported by this animal *, and from the time of King Henry IV., the office of *Antelope Pursuivant*, had been instituted and continued to the end of the Lancastrian branch. Whether heralds had an obscure knowledge of the animal through their intercourse with the Crusaders, cannot now be ascertained; but the name itself, appearing nowhere in classical Greek or Roman writers, seems derived, according to the learned researches of Baron Cuvier, from Ανθολοψ, used by Eustathius, Bishop of Antioch, who wrote during the reign of Constantine †.

* The arms of this Prince, painted, among other embellishments, upon a prayer-book, once his property, and bearing evidence of the Bruges style of that period, represents the Antelope black, with straight spiral annulated horns, evidently copied from those of an oryx, though placed almost at right angles upon the head; the animal has gilded tusks, but in other respects is not ill drawn. The Antelope is at this time the badge of the sixth regiment of infantry.

† The Baron, indeed, writes Antholopos, probably from an error in the press: it occurs in the *Hexamæron*, and is sufficiently curious. The Antholops is represented as very swift, and hunted with difficulty; it has long horns in the shape of saws, with which it saws trees of considerable elevation and thickness. When thirsty, it approaches the Euphrates, and gambols along its borders in the brambles, where it is sometimes entangled, and there caught and slain.

What animal he understood by it is not very evident; the compound name might be a mere paraphrase of Gazal, and meant to signify fine or blooming eyes. Other names are, however, derived from it in the Greek and Latin of the middle ages. Antalopos, Analopos, and Aptalos of authors, the Calopus of Albert the Great, and the very Panthalops which Bochart would make a Copthic word to designate the Unicorn, are all corruptions of one, by which the Greeks of Western Asia seem at one time to have understood an oryx.

From the institution of the genus, all Bisulcæ which did not clearly belong to the other genera already established, were without further consideration crowded into *Antilope*, till the last formed exceeded in number of species all the others taken together. In the confusion, naturalists were struck with the very great disparities in the extreme species; various subordinate associations were attempted, but no additional genera, excepting, we believe, by M. Brisson. At length Professor Lichtenstein formed the twenty-nine species then known into four families or groups, the Bubabides, Connochætes, Antilopæ, and Gazellæ. M. de Blainville soon after instituted eight subgenera, which he distinguished by the names of Antilope, Gazella, Cervicapra, Alcelaphus, Tragelaphus, Boselaphus, Oryx, and Rupicapra, in which he noticed thirty-nine species. To these M. Desmarets added three more, the Egoceres, Oreas, and Mr. Ord's Antilocapra.

Although these arrangements certainly tended to the perfection of our knowledge on the subject in question, yet the species being many of them very imperfectly known, found their location in the subdivisions to which they do not belong, or groups were formed of animals sufficiently distinct to constitute separate genera. The flexures of the horns gave alone a simple, but at the same time a purely artificial, classification, in which the most remote species

were placed in juxtaposition. It may be presumed that the defective state of our information induced the Baron to confine his view to such species as he had the means of comparing osteologically, and observing the want of importance in almost all the characters which can be assigned, to rest contented with the artifical arrangement just noticed, nearly such as Pennant and Shaw had left it. In adopting the artificial arrangement, that great zoologist, so far from objecting to a natural classification, points out himself the necessity of alterations, and among others that of removing the Gnoo.

In this state we found the leading genera of the Cavicornia, and in particular Antilope, when our own collection of notes and drawings relative to this genus had been gradually accumulating for twenty years, the fruit of personal researches on the west-coast of Africa, the wilds of both Americas, and the examination of forty-two public museums, and many private collections in both continents, until we were enabled to compare our sketches from living and stuffed specimens, amounting to one hundred and thirty-five representations of animals, and above one hundred of fragments, skulls, horns, skeletons, feet, &c. In this enumeration all those are excluded who, upon comparison, were not different in species, sex, age, or variety of colour, or other circumstances. With this mass of materials, superior, we believe, to what can well be in the possession of other Zoologists, we find it, nevertheless, far too scanty in documents to come at a disposition sufficiently satisfactory for the expectations of science: but enough is amassed to prove that the indications of travellers have commonly more precision and truth than has been admitted; and that the imputations of negligence and ignorance, which are so convenient to writers of nomenclatures and systems, generally take their origin from a disposition to force separate subjects, species, and names, into one

known designation. Notwithstanding that an attempt to establish a natural succession of groups, encumbered with its endless recurrence of anomalies, is further impeded by the interposition of the genera Capra and Ovis, we shall endeavour to show the progress made to be principally derived from the accumulation of new species, whose characters have led to an additional number of groups for some, and the proposition of two new genera for others; thus forming a connected series of all the Cavicornia, the Caprine tribe passing into the Bovine at an arbitrary point of separation, which it seems resides among those species which are strictly independent of either.

In every attempt to find characters sufficiently constant to serve for distinctive signs of the groups or racemi, even when these are considerably augmented in number, we found that the flexures of the horns were inapplicable, because they occur seldom more than in one animal of a group, though in all other characters its component species are perfectly homogeneous. As, therefore, the horns assume in osculant species a great variety of shapes, recourse was had to the combined characters of stature and the superior elevation of the spinous processes, arising from the interscapular vertebræ, the comparative depression of the croup, the position of the osseous nuclei on the frontals, provided with a cell at their base, and other inferior distinctions, all of which we wish naturalists to verify. These afforded data sufficient to separate most of the larger anomalous species from the genus Antilope, and to place them under the proposed name of Damalis, near the Bovine tribe. To the Bovina we refer the Gnoo of authors, also forming a new genus distinguished generically as Catoblepas, and forming the first of this, as Damalis constitutes the last of Caprina. Having thus far disposed of the evidently-anomalous species, it was desirable to arrange the succession of the subgenera or groups retained in Antilope, so as to place those

who still bore an analogy to Cervus nearest that family, and then to class the true Antelopes and Gazelles into approximating gradations to Capra and Ovis. At the head, the groups Dicranocerus, Aigocerus, and Oryx, might, perhaps, be more properly converted into genera; but that the two latter seem to form types to which the cycle of the tribe returns through Damalis: and, besides, the Oryges contain the species from which the genus Antilope, as already noticed, obtains its name. Notwithstanding their size, the characters of Oryges are truly antilopine, and the Aigoceri have so much affinity to them that they cannot be separated with propriety by the interposition of others. As such these two racemi should take the lead, if the small American group Dicranocerus did not appear more naturally placed before them, because they have a greater external similarity with Deer. After these three, the Gazellæ and Antilopes follow, succeeded by the Reduncæ, Cervicapræ, and other Racemi or groups, several of which we have thought it advantageous to place into additional subgeneric clusters, designated by proposed names which either explain some common property in the species or are derived from an indigenous name. Should some of these groups be hereafter considered as real genera, the proposed denominations and locality in a natural order may here, we hope, be found approaching to their fixed position in nature. The latter groups in the series assimilate gradually with Capra: among these, Nemorhædus has nearly all the characters of true Goats, but is still possessed of antilopine horns, and Anoa presents the anomaly of caprine characters with horns which partake of the Buffalo and Ovis; while Aplocerus shews another anomaly of characters; in which Nemorhædus is compounded with both Ovis and Capra, and as such it is the last, and forms the connecting link with these two genera. After these we place our proposed genus *Damalis*, divided into groups according as their more

obvious characters seem to lead them nearer to Bovina, the last being Portax or Antilope Picta of authors. It is at this point that we think the separation may be deemed arbitrary, because all the Damales might be viewed by some as more properly included in the Bovine tribe; but reflecting that the Acronotine group in particular, recalls the high shoulders of the Aigoceri, it seems that we find the cycloid revolution of the characters which pass through the tribe, while the next Catoblepas shews a predominancy towards those which constitute true Bovina, in the head which approaches Bos Caffer through Ovibos and the feet to B. Bison, where we terminate the order.

Of this arrangement we dare only say, that it seems to be the least objectionable in the present state of our knowledge on the subject; awaiting the judgment of Zoologists, whose opinions we hope to apply at no distant period in an intended monograph, in which we shall be anxious to produce figures of both the males and females of many species never before published, and the anatomical fragments of others, whose complete forms are still wanting in the published works of authors: but although we have said thus much to establish our motives for the present distribution, we cannot but view the propriety of the innovations with doubt and hesitation.

Notwithstanding our assertion that no fossile remains of the Caprine tribe, Antilope, Capra, Ovis, and Damalis, have yet been satisfactorily determined, it appears that Baron Cuvier regards several fragments, found in the osseous brecciæ of Italy and the Adriatic, as probably derived from them.

The Genus Antilope.

This genus forms the head of the Caprine tribe, because its subordinate groups display almost invariably cervine proportions in the elegance of their conformation, and one

group in particular carries the resemblance even to a similarity in the shape of the horns. In common with the rest of the Caprina, their horns are persistent; consisting of a solid bony core, with a true horn vaginating upon it. These are present or absent in the females and in the males, sometimes to the number of four. The core or osseous nucleus is solid, destitute of sinus or pores within the base; it stands generally almost above and between the arches of the orbits. The horn itself turns into various curves or directions, often without consimilarity in the kindred species of the groups. The ears are usually long, moveable, and furnished on their internal surface with three striæ of whitish hairs upon the naked darker ground of the skin. The eyes, likewise in the greater number, are large, prominent, dark and soft, and beneath them, in the direction of the nose, a sack is found in most species, more or less developed, opening externally by a slit, as in certain deer, and in some appearing to communicate with the nostrils and the olfactory apparatus; while in others again, a puncture only is seen, and a second sack descending near to the corners of the mouth, likewise communicates externally by a slit or a puncture: the former of these seems to afford increased facilities in breathing, and greater powers of scent; but the use of the latter is as yet unascertained in the animal economy. The nostrils are usually shaped as in sheep, or without a naked and moist muzzle: some, however, have this form half developed, or a half muzzle, and others again have one as complete as in the Stag, but never to the extent which is seen in the Ox or Buffalo. They are provided with a gall-bladder. The mammæ of the females are always inguinal; in number either two or four, and these are often observable in a rudimental state on the abdomen of the males. Beside these, in the hollow part of the groin, small naked folds of the skin or inguinal pores are found, one on each side of many of the middle-sized

and small species. Within them an unctuous and odorous secretion takes place, similar to that which is found in the suborbital sinus, but the use or utility is not as yet ascertained, though some inference might be drawn from a habit common to the species provided with them, of rubbing and pressing both these parts against hard substances, and then seemingly deriving great pleasure in smelling at the substance extruded. The tails of these animals are round, either short, or descending to near the hough; the legs of nearly the whole are slender, firm, and elegant, often furnished with brushes or tufts of hair on or below the knees, and the greater number have the anterior quarters somewhat lower than the croup. In general their attitude is more gathered; that is, they stand with the feet more under them than Deer, and hence, their bounds are greater, and their speed in general surpasses that of every other mammiferous animal. The hide is either white or black, but these colours seem to be constantly connected with locality: the black being, perhaps, invariably independent of the colour of the hair, an indication that the animal is a resident of the open burning plains and deserts of the tropics; and the white, one who resides in more temperate regions, or lives under the shadow of the forest.

The groups with spiral and lyrated horns are mostly gregarious, frequenting the open plains, and often preferring the most barren tracts; the larger species, however, more usually live in families or small troops, on the desert or in mountainous woods, and the smallest are not unfrequently solitary or monogamous, residing in the thickets, the forest, or the borders of rivers; while there are others whose habitat is confined to mountainous regions, inaccessible craggs, and even to the elevated zones on the confines of perpetual snow. These walk with perfect composure along the giddy brinks of the most awful precipices, climb and descend with wonderful care and precision, and leap

down or up to the smallest surface that will contain their collected feet with perfect firmness; but the speed of those who frequent the plains, and more particularly of the swiftest species, consists in the alternate action of three or four strokes of a gallop, terminated by a long bound, repeated in constant succession and producing a beautiful effect: of others it is an uniform stretch termed running. Though vigilant and timid by nature, the gregarious species have the same curiosity which Deer and Sheep evince at the sight of strange objects; flying with prodigious speed, then stopping and turning to gaze. Their voice is mostly weak, and seldom heard: it consists in some in a feeble bleeting, in others it is a groaning or whistling sound, and there is one which barks so as to deceive the unwary traveller into a belief that he is near the abode of man, when in fact it is the proof of his being benighted in the deepest recesses of the wood.

In a wild state it seems that each species feeds on a few favourite plants; they pick rather than browse: some, like several species of Deer, nibble the leaves of trees, Acacias, Mimosas, and shrubs. The gregarious keeping on the open plains, select grasses and their roots, heaths, wild tritica, and are not averse to bitter succulents and intoxicating plants, being even attracted by the smoke of tobacco. There is a disposition in several species to dung in one place, which arises probably from the extreme delicacy of their sense of smelling. In general their venison is lean, and savours of a musky or a Caprine smell; but the flesh of others is praised, and all afford the usual meal to the larger nocturnal Carnivora, and even to the Eagle. The females, particularly of the gregarious species, are gentle and confident when reduced to domesticity, but the males, at least in the rutting season, are vicious and subject to sudden capricious fits. The beauty of their soft and large dark eyes, has long been the theme of Arabian and

Persian poetical enthusiasm. The very name Gazelle, by which several of the genus are designated, is derived from the Arabic Gazal غزال signifying this animal, or a young fawn, is also an image of peculiarly tender and delicate women; it is likewise applied to a species of stanza of highly polished and tender versification: the root, however, seems taken from the Hindu Sasi or Sasin, the name of the Common Antelope. It appears that in the beautiful regions of the East, beyond the river Indus, these animals have attracted the notice of mankind in an extraordinary degree, even in the primitive ages of that land of early civilization; for we find them in the oldest mythologies, and among the symbols of its astronomy. The Sasin figures in the Rasi Chakra or Hindu Zodiack, instead of Capricorn; the goddess Chandra or the Moon rides upon an Antelope, and Mahadeva Pancha Mukti holds one of these animals by the legs. In the *Institutes of Menu*, certainly more ancient than the Macedonian invasion, we find that under certain circumstances, the Bramins were not only allowed but directed to be fed on the flesh of the Ena or Spotted Antelope, and the Ruru which appears to be the Leucoryx *. From these causes the whole genus is held sacred to Chandra or the Moon: but it may be surmised, that this consecration was originally confined to some species, perhaps still undescribed, whose horns exhibited a sort of resemblance to a crescent.

We begin by the group which, in the form of the horns, the short tail, and disk on the buttocks, approaches nearest to the Deer.

* See the *Institutes of Menu*, chap. iii. v. 269. They were to be fed six months with the flesh of Kids, seven with Spotted Deer, eight with that of the Spotted Antelope *(A Cervicapra)*, called Ena, and nine with that of the Ruru: the Risia or Antelope Picta of authors, is not considered as belonging to this series in the Sanscrit writers.

The Dicranocerine Group*.

Mr. Ord published an account of the first, and, perhaps, only species of this group, in the *Journal de Physique*, 1818; after M. de Blainville had noticed, in a very imperfect manner, a pair of horns which are in the Royal College of Surgeons, in London, under the erroneous name of *Cervus Hamatus*. Next appeared an article in vol. xiii. of the *Linnæan Transactions*, where five species of America are introduced, and described as *allied* to the genus Antilope. Mr. Ord very properly regarded the animal he described as an intermediate species, and upon this opinion formed his genus *Antilocapra*, a denomination which we would adopt but for the consideration stated below†. In

* Διχαινον, furca, κερας, cornu.

† Dr. Harlan, in the *Fauna Americana*, professes himself ignorant why the author of the paper in vol. xiii. of the *Linnæan Transactions* on animals of America allied to the genus Antilope, did not adopt Mr. Ord's specific name of *Americana* for the animal in question, his description having the right of priority. In justice to both these gentlemen it may be proper to observe, that Mr. Ord may himself recollect the author's statement in 1817, of his intention to publish his drawing and notes of this animal before he, Mr. Ord, had laid his before the public. Accordingly the materials were prepared for the purpose, but delayed by a protracted course of travelling, and still more by remaining about two years at the Linnæan Society. Hence Mr. Ord's and M. de Blainville's were unknown, if not posterior to his own original paper: but if the author had known of their existence, he is still free to confess that he would not have adopted the proposed nomenclature, because, philologically considered, the compound word *Antilocapra* offers a vicious structure, being composed of two different languages, and the first part not even classical Greek. Now in technical terminology we have the authority of Fabricius to reject them. *Nomina Hybrida nullo modo toleranda*. Next, if the names of genera and species are intended to convey some notion of the form and characters of the subject they intend to designate, the compound *Antilocapra*, would express an intermediate between Antelope and

common with Messrs. Ord, Harlan, and Rafinesque, we consider this species as described long since by Hernandez, under the name of Mazame; and we presume the dissent of M. Desmarets has arisen from his not having had the same opportunity to compare the specimen of Furcifer with the plate of Hernandes, of the edition which we consulted at Philadelphia; and, perhaps, from his not having a faithful translation of the paper in the *Linnæan Transactions*. This opinion is countenanced by his assigning, in the *Mammalogie*, to *A. Palmata*, "Pelage d'un fauve clair sur le dos, blanc au ventre et sur les flancs," characters which are not in the description of that animal, but

Goat, or an idea of that group which will be designated here under the term of Nemorhædus, whereas the resemblance is between the Antelope and Deer, by the most characteristic indication in the creation, namely, the branched horns. As for the trivial or specific name *Americana*, no doubt names of geographical designation are occasionally proper for specifical appellations, especially if they refer to more confined subdivisions of the earth, and the subject is destitute of prominent characters, or is both large and isolated. Thus *Elephas Asiaticus*, *Rhinoceros Sondaicus*, are as proper as *Ursus Americanus* is objectionable, and only to be retained because long established: for, in the distribution of animated nature it is a law, with but few exceptions, even in the middle-sized Mammalia, that in whatever portion of the earth of considerable magnitude a species be found of any genus, two or more allied to it may be looked for; and, therefore, upon the discovery of a first as yet isolated species, the name, if possible, should be expressive of some obvious character, or the local name, if not too barbarous, should be latinized, in preference to a geographical denomination, and most particularly so if that denomination would extend over a fourth part of the globe. Where none of these occur, a provisional name, even of a person, is preferable. For these reasons the name of *Furcifer* is retained in preference to *Americana;* but not even for them alone, but also because at that very time the author had already, as in the case just specified, a second of the same genus or group, which he had reason to consider of the same country, to indicate.

appear to be added from Hernandez, unless that acute zoologist, in opposition to his own doubts, admits the soundness of the author's supposition*. Now the text of Hernandez appears clearly and distinctly to apply to one of this group, and most likely to *A. Palmata*. "Mazames," he says, "Caprarum mediocrium, paulove majori, constant magnitudine; pilo teguntur cano et qui facile avellatur fulvoque; sed lateribus et ventre candentibus, ... cornua gestant *Juxta exortum lata ac in paucos parvosque teretes ac præacutos ramos divisa*; et sub *eis oculos*." This description cannot apply to any known Deer of America, not even to *Cervus Coronatus*, still less when we refer to the figure Recchus, who justly viewed this species, and possibly another to be noticed in the sequel, as Antelopes, or in the language of his time as Capræ; says, "Hos (Teleth cal Mazame et Temmamazame) ego potius computaverim in capreos quam inter cervos†." The original mistake was made by Count de Buffon, who, in a sweeping clause, for which he most certainly had not sufficient grounds, refused to America indigenous Goats, Sheep, and Antelopes, prior to the discovery of that hemisphere by Europeans: it must, however, be confessed, that so extraordinary a conformation in the horns as the Dicronoceri offer, could scarcely be suspected from the rude plates of earlier naturalists, unless they had been explained with that care and minuteness which the moderns generally observe.

The Subgeneric or Racemous name Dicranocerus, which we propose for this group, is sufficiently explicit to require

* Mr. D. is likewise not correct when he says, "Cet animal que," Mr. H. Smith, "Rapporte au Mazame d'Hernandez." . . . Now the text says that the Mazame is one of the *group*, and, probably, *A. Palmata*.

† *Nard. Ant. Recchus apud Hernandesium*, lib. ix. cap. xiv. p. 324 et 325, *figuras ad ipsas paginas*. See also *Hernandes rerum medicarum Novæ Hispaniæ Thesaurus*, cap. 15, p. 324.

no further observation: the animals included are, as far as they are known, exclusively American, and confined to its northern latitudes. By the singular structure of their horns, which have an anterior branch, and a prolonged posterior point turned down into a hook, there is a similitude though no affinity with the Deer; which is further evinced by pearly rugosities, shewing like incipient additional branches, by a white space on the rump, and a short tail. They are exceedingly swift, living in small families upon the hills below the high mountains, and above the low lands along the Upper Missouri, round Hudson's Bay, and, probably, to the extreme verge of the north-western coast of Nootka, and Behring Straits; they might be looked for on the north-eastern shores of Asia, but although the Argali has spread to both Continents, it does not appear that this, the *A. Lanigera* or the Musk Ox, have yet been observed alive in that quarter of the world.

In the Journal of M. Le Ray, an account appears of the mode adopted by the Sioux Indians in hunting these animals. He says, "that being with the hunters on the river Jaune, in pursuit of the Cabree, as they are termed by the Canadians, the party selected for the sport a hill, the ascent of which was gradual, but the opposite precipitous: at the bottom of the slope they formed a chain of hunters, and crawled gradually and simultaneously towards the summit, slowly inducing the game to approach the precipice. When arrived at a convenient height, they all suddenly rose and gave a loud yell, which terrified the timid creatures so completely, that most of them sprang over the brink, and were dashed to death in their fall. Upwards of sixty Cabree and big-horned sheep being thus slain in a single beat."

The *Prong-horned Antelope. (A. Furcifer.)* In the general aspect of this animal there is a resemblance both with the Chamois and the Roebuck, though it is larger

PRONG-HORNED ANTELOPE.

A. furcifer.

than either. The form is more elegant than that of the first, and the structure more robust than in the second. The horns are about a foot in length, measured along the curve, five inches in circumference at base, compressed, nearly flat on the inside and roundish on the outside, having small horny pearls scattered principally on the internal surface, among transverse wrinkles and striæ: they stand in a tufted base nearly between the orbits, and two inches asunder, directed vertically, but hanging slightly over the eyes. They carry the same thickness upwards about seven inches, where the anterior part terminates in a compressed and striated snag, pointed forwards and upwards, forming a fork with the posterior part, which becomes suddenly round, taper, and smooth, and turns backwards and inwards, ending in an obtusely pointed hook; their colour is a brownish-black, the horny substance thin at the base and slightly translucent, and the hollow within sufficient to admit the two fore-fingers; the eyes are large, dark, and placed high in the head; the nose is small, slightly convex, and ovine; the forehead broad and flat, the edges of the orbits solid and prominent: no suborbital sinus is visible. The ears are six inches long, narrow, pointed, fawn-coloured outside, and lined with long white hair; at the back of the head the hair rises, and forms a kind of tuft of a reddish colour; the forehead, nose, temples, neck, back, and hams, are of a foxy-dun colour, with the sides paler; the lips, chin, two spots on the throat, one on the top of the head, one below the ear, the breast and belly, are yellowish-white; the disk on the buttocks, and the longish hair of the tail purer white: all the legs are of a bright ochre colour. The animal measures about three feet at the shoulder and croup, the form of the joints and limbs indicating great powers and activity; the shanks or cannon bones of the hind-legs are longer in proportion, than in other ruminants of the

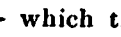
same stature; the pasterns are high, and the hoofs remarkably low and black; the texture of the hair is thick, coarse, flattened, undulating, and deciduous *.

It does not appear that the characters of the female have been observed, excepting that it has horns like the male. The species inhabits the borders of the Missouri, the north-western territory of the United States, and, according to Dr. Harlan, the great plains of the Columbia. It is described as wonderfully fleet, and darting over the plain without stopping or looking round as occurs in many of the African species.

The *Palmated A.* (*A. Palmata.*) Whether the animal here noticed be a real species or only a variety of the preceding, is a question as yet undecided. In the paper before alluded to, a pair of horns are described and figured, still measuring eleven inches along the curve, although they are partly injured at the base. They are no doubt the same which M. de Blainville ascribed to his *Cervus Hamatus*, notwithstanding that they are perfectly hollow, two inches and an half across in their greatest diameter by one inch and a quarter in the shorter; their shape is greatly compressed at the anterior and posterior parts into a sharp edge, and the substance a hard, black, and brittle horn, with the surface strongly pearled and striated for about seven inches upwards. Anteriorly, how-

* There is a small increase in my dimensions compared with those of Mr. Ord taken from the same specimen; but although I noted them while a friend made the measurements with an inch tape, I suspect the error on my side. The despatch of a traveller should in this case give way to the more leisurely observations of a resident of known accuracy. Dr. Harlan, however, *Faun. Amer.*, page 251, describes the flanks as black, probably from an error in the press, and the reddish mane on the neck is not in my notes nor in my figure.

ever, soon after its origin, the blade widens as it ascends, until it terminates into a broad, compressed, leaf-like, obtuse, deflected, striated, and pearled process turned inwards; the posterior part from this bifurcation assuming a round, taper, and regularly-uncinated form, larger, more turned inwards and pointed than in the preceding. Upon and near the ridge which unites the leaf-like part to the after horn, there are on each side one or two small knobs or buttons of horn, above one-third of an inch high, resembling incipient ramification.

By the expedition to Baffin's Bay the native region of this animal is determined, and the probability of its being a second species increased. In a head, several horns, and a mutilated skin, which we have seen, the differences between this and the former appears to be in the constancy of the elongated lozenge  which the section of the horns presents, whereas a similar section of those of Furcifer shews a compressed oval in the width and early commencement of the leaf-like process, its internal direction and the rudiments of others, in the posterior curve being much larger and more turned inwards, the horn being also more voluminous in proportion to the animal, which, however, is described as very like Furcifer, but lower and more robust about the limbs. The head which we saw was shorter, wider across the orbits, and the nose almost straight. The fur appeared more soft and woolly, with a mixture of hoary hair, little or no white about the face or lips, but more on the breast and belly: thus approaching by the characters of the horns to the *paucos parvosque ac teretes ramos*, and the *Pilo cano* the designations of Hernandes, who, perhaps, described the winter dress*.

* The skin which we saw and the head were probably in the summer habit from the period of time when the specimens were obtained: the winter dress is doubtless more hoary. We are

The Palmated Antelope inhabits the bleak regions near the Frozen Ocean, the fragments above described being brought from Baffin's Bay, from whence the species seems to extend to the Stony Mountains and the river Jaune. Excepting the characters of the horns, no dissimilitude sufficiently marked is observable in this notice to fix a positive difference of species; but we think them nevertheless sufficient, especially as the present is a mountain, and the former a champaign animal, to leave the descriptions under two separate heads until the question can be cleared up in a satisfactory manner. Considering the high latitude which the palmated species inhabits, we are tempted to view the flattened processes on the horns as a provision of nature, perhaps to shovel the snow off the mosses and lichens upon which they must principally feed, in a country where other vegetation, and even the birch is very rare, if, indeed, the assertions of the Indians with regard to the similar practice in the Moose and the Caribou can be sufficiently relied on. From the circumstance of the Palmated Antelope residing in the mountains, it is probable that the Kluche Indians consider this as the *Kistuhé*, or Little Elk. Though small reliance should be had on names, which often have no specific meaning, even among more polished nations, the American Indians, living solely by the chase, are, nevertheless, usually deemed remarkably correct in their ideas of animals, and the Kluche from whom we obtained our information shewed that in his person the observation was correct*. In the west of North America,

aware that in the zoological part of Captain Parry's voyage the two species are considered as one; but the distinction in the horns not being referred to, and the above materials having been examined by us, our former opinion is strengthened instead of weakened.

* We asked if he knew the white-feathered bird of prey, whose pinions adorn the hair and the spears of the Indians? He answered immediately, that the bird was among our drawings, and turning

about the fur establishment of Carlton House, the Indians reckon two *Deer* indiscriminately, named Apeesce Mongsoos, or Little Moose; and they are further distinguished by, 1. Athee-Neethoo Apeesce Mongsoos, or real Little Moose; and, 2. Kin-waithoos, or Kin-way thoo weyo Apeesce Mungsoos, or Long-tailed Little Moose; but whether these names are applicable to the foregoing species, to Rein-deer, or to species of our group of Mazama, cannot at present be determined.

The Aigocerine Group.

This and the following group might be viewed as forming one genus, divisible into three subordinate racemi, by characters which are observable through the whole; but we have already stated the principles which guide our preference to retain them as genuine antelopes. The Aigoceri are distinguished from all other groups of the genus, by the large stature of the species, the elevation of the interscapular vertebræ, and the fore-legs being somewhat higher than the posterior. The horns are large, robust, annulated, and bent back, as in the Ibex, standing rather near the orbits, and rising vertically from the forehead, with the annuli most prominent towards the front, and reaching upwards to about two-thirds of their whole length; the rest smooth and pointed: they are invariably black and common to both sexes. The nostrils are placed near a widening half muzzle; a white streak passes before the

them over, pointed to the tail of the Ring-tailed Eagle, saying, that they were always obtained from the tail of that bird. It was with the drawing before him that he recognised the Prong-horned Antelope, and observed that in the figure the horns could not shovel the snow, which in the valleys of the Stony Mountains, lies often, according to his account, ten feet thick. We were at that time unacquainted with the palmated species, which it now seems he had in mind.

inner canthus of the eyes, obliquely down the face; these are not provided with a lachrymary sinus: a mane of more or less length runs in a reversed direction along the neck; the tail descends to the houghs, and is terminated by a tuft; long hairs hang from the throat, and even from the chin, assuming in some the form of a beard. The hide is black, independent of the colour of the hair, the ears are long, the legs without the slender elegance of other groups, but the whole of their structure remarkably powerful and sinewy.

The group is confined to South, and probably Central Africa, frequenting the scattered woody districts and the desert, sometimes retiring to the forests, and living in small families, headed by an old male.

In the highly-interesting travels of Messrs Denham and Clapperton, into the interior of Africa, mention is made of flocks of wild animals called Korookoo, by the Bornouese, and by the Arabs, El Bucher-Achmer, the Red Bullock, noticed as found in all the woods. They have immense horns, and are something between the Ox and Antelope. One had "spears struck at him without number, but he effected his escape, carrying off several sticking in his flesh." It is not improbable that the *A. Grandicornis* is here meant, but we regret the conciseness of the notice.

The *Blue Antelope. (A. Leucophæa.)* The Blue Antelope, or Blauw Bock of Kolbe, was formerly not uncommon in the vicinity of Swellendam, in the Cape colony, but now so rare, that no specimen has been killed in South Africa since the year 1799. Mr. Allaman first described and figured it from the spoils of one shot by Colonel Gordon, under the wrong name of Tseiran, or Dzeren, which belongs to a smaller species of Asia. It is an animal of considerable beauty, four feet high at the shoulder, and above six feet in length; the horns are slightly compressed, and assume the curve of a scimitar,

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measuring twenty-eight inches along the curve; at the base they are closely wrinkled, numbering from twenty to thirty annuli, without appearance of striæ; the ears are long and pointed, gray at the back, and white within; a white spot passes before each eye, extending downwards towards the mouth; the forehead and chaffron are dark gray, as also the anterior part of the legs; the inside of the limbs is white: but what distinguishes this animal most, is the silvery blue-gray of his coat, occasioned by the hair, which is rather long and coarse, lying sparingly scattered upon a shining black hide, which is also the cause why the beauty of this colour fades into a duller gray after death, the skin becoming browner with drying.

There is a short mane of reversed white hair on the neck, and the muzzle is black; but the beard ascribed to it by Kolbe is more doubtful, because not observed in the figures or specimens, though it is not improbable that the long hairs composing it are inclined to drop out from the skins, or perhaps only remarkable in the rutting season, and wanting in the females.

The manners of the species are totally unknown, and the horns are rare in cabinets of natural curiosities. The only specimen now known is in the Museum of Paris, whither it was brought, we believe, from the collection of the late stadtholder of Holland. We possess a drawing of the individual, which, however, is far inferior in beauty to another which we copied from the original drawn by Colonel Gordon, a duplicate of which appears figured in the works of Count de Buffon.

The *Roan Antelope. (A. Equina.)* This species exceeding the former in stature by five or six inches, and measuring about eight feet in length, is, nevertheless, so nearly allied to it in form and characters, as to have been suspected of being only a variety, but upon a close examination, the differences are sufficiently evident. The

horns are very stout, but something shorter, the curve backwards commencing nearer the base is more sudden; they exceed two feet in length, marked with wrinkles at base, and from seventeen to twenty-seven complete rings, having the superior third smooth: they stand closer together than in the preceding, and more remote from the orbits; the ears are more than nine inches long, and the hair of the body is long, undulating, coarse, and rather scanty, forming a gray more or less of a mixed reddish and white. Under the throat the hair is still longer, white, and hanging down; a streak formed by a pencil of long white hairs, passes across the anterior angle of the eyes, and the white spot extends in some round the orbits; a spot on the forehead, and the region round the mouth and muzzle, are also white; the rest of the face, cheeks, and outside of the ears are bright chestnut or red; on the neck there is a low ridge of white hairs turned in a reversed direction towards the head. The belly is white, and the tail reaching to the houghs, about twenty inches long, and the tuft at the end dark coloured; the legs are of a dirty ochre, and the hoofs black, and both broad and long.

This description, taken from the specimen presented by Mr. Burchell to the British Museum, differs slightly from that of Messrs. Cuvier and Geoffroy, who first gave an account of the species, from that of Paris. Their specimen however, is inferior in preservation, and even in stature to the pair which Mr. Burchell brought to England, but older by the superior number of annuli upon the horns which amount to twenty-seven, whereas the British have not more than nineteen and twenty-one true rings upon theirs: these also have the hair longer and looser, forming confused clouds and fleabites of brown vinous-red and white. The larger measures from nose to tail, seven feet three inches; at the shoulder about four feet four inches in height; the tail and tuft, one foot six inches; the horns

along the curve, one foot nine inches; the distance between them at base, one inch and a half, and at the tips, one foot; the ears nine inches and a half.

That enterprising and scientific traveller discovered his specimens while in search of the Takhaitze of Mr. Daniell, upon the most elevated plains and hills which divide the waters of South Africa in the vicinity of Lee-takoo. They are said to live in pairs, or small troops of four or five together, keeping chiefly among the scattered open woods about the sources of the Gareep.

There is a horn preserved in the Museum of Paris, resembling those of the two preceding species in its general characters, but probably of an animal still undescribed. It is exceedingly heavy and thick at the base, three feet five inches and a half long, and marked with forty-eight or forty-nine annuli. No memorandum indicates from whence it was brought, and as several unknown fragments of a zoological nature have been formerly introduced into France from its establishments on the west coast of Africa, it is possible that it came from thence, and, perhaps, belongs to the Empalanga, Empabunga, and Empalunca of Purchas, De Bry, and other authors and travellers. De Bry represents this animal as similar to an ox, excepting that it carries the head and neck erect like a stag, and is armed with long horns knotty at base and the points turned inwards. In another place the horns are said to be straight, only bending slightly inwards at the tips*.

The *Great-horned Antelope, Antelope Grandicornis* of Herman, is another which may belong to the same animal, if we judge from the horn described by that learned pro-

* De Bry. *Regnum Congo.* page 22. Icon. in prima parte Iconum ad Indiæ orientalis partem II.

fessor, in the *Observ. Zoolog.* i. 88. It is stated to be fifteen inches in circumference at base, two feet and a half long in a straight line, and three feet and a half if measured along the curve. It is erect, the point bent back, compressed, rounded behind, carinated and rough; on the internal side smoother, and separated from the back by an obsolete ridge, through which, the summit being smoother, oblique wrinkles ascend, and along the external surface, furrows more numerous but less deep descend*. This horn was brought in 1795-6, from L'Orient in France, and conveyed to Sweden; it was probably obtained through the commercial relations of that city, from the west coast of Africa, and may also be suspected to have belonged to the Empalanga or Wadan, if both names do not refer to the same animal; which also the Korookoo of the Bormouese may designate.

The *Takhaitze. (A. Barbata.)* Among the unsatisfactory indications of names and horns, we have another species to notice, figured under the above denomination, by Mr. Daniell, in his *African Scenery* and there said to be in stature, general conformation, and colours like the Blue and Roan Antelopes. It has been surmised that, in fact, the Takhaitze was no other than the above, and this probability was increased by Mr. Burchell searching in vain for the present animal where it was said to exist, and finding in its stead the Equina already described. That animal when seen at a distance, appears rufous, and, in fact, among Mr. Daniell's original sketches, we have seen one of this animal so coloured; but we are assured by his surviving brother, that the long mane, the beard, and the character of the horns is the same in all the

* I must here observe that my version is taken from a MS. so illegibly written that I am not sure of the correctness of the above translation from the Latin. It is not improbable that *A. Grandicornis* belongs in reality to our proposed genus *Damalis*.

original drawings (for there are several), and considering the acknowledged fidelity of the figures designed by the late Mr. Daniell, the most natural inference seems to be that it is a new species, distinguished by a flowing mane of a dark colour; a dark beard under the chin, and having horns less vertically placed on the head, less curved, marked with fewer annuli, and, as it would seem, almost united at base. It is further distinguished by wanting the tuft of hair at the end of the tail, and by a white streak which passes down the face: the colour of the hair is bluish on the back, passing to rufous on the belly and limbs, and as before observed, in one of the original drawings, rufous all over the body.

These characters would seem to suit the Fish-tail or Lerwea of Shaw, but, we believe, that these names are nevertheless more applicable to the mountain Argali, *Ovis Tragelaphus* of Geoffroy, as we shall endeavour to shew in the sequel. Although Mr. Burchell did not find the Takhaitze in the quarter where it is reported to reside, it may be observed that the absence of certain animals from districts in which they had previously resided, is not unprecedented, particularly in South Africa, where the variations of the wet and dry seasons, cause migrations in several species of ruminants, and along with them of certain Carnivora who prey upon them. With the excess of one or the other of these seasons, they not uncommonly make their appearance in parts of the country where they were previously unknown, and in like manner withdraw for several successive years, or altogether, from others where they used to abound. It might be the Takhaitze which was already noticed at the Cape, under the name of Baas, or Bearded Ox, many years before the travels of Dr. Somerville and Mr. Daniell; it was reported to have shorter horns, with a beard under the chin and on the breast, and to be of a gray colour; larger than an ox, and residing to the

north, beyond the limits of the colony. This description would have induced us to affix the name of Baas for the specific designation of the Takhaitze, if it were not more likely to be referrible to the Brindled Gnoo.

The Orygine Group.

Although the name of Oryx may be derived from the same early Caucasian root, which has left its traces in the Sanscrit and Teutonic Urox, it seems, nevertheless, to be legitimate Greek, implying majesty or beauty, and to have been celebrated among the ancients, without being altogether well understood. Aristotle was informed that the animal had cloven feet, and only one horn. Pliny adds that the hair is reversed. Oppian represents the Oryx as large and fierce, with white hair and black cheeks, having long horns, very sharp, and hard as iron: with these, he is said to contend successfully against the most powerful animals. Strabo and Lampridius observe, that offensive weapons are made of them in Africa, which will pierce even the skin of an elephant; and Herodotus, that they served to make musical instruments. In all these accounts, some species of Oryx is always evident: even in the Aristotelian story, we find this animal is intended by the subsequent repetitions of the same assertion to the present time. As we have already seen, Bochart notices an unicorn by the name of Pantalops, which is only the word Antholops disfigured. There exists a rare English print belonging to or intended for some work we have not been able to trace, which represents an unicorn, in every respect resembling the Oryx, excepting the horn. The pretended Unicorn of Bhootan, we shall find to be referrible to the group we have under consideration, and the notice of Mr. Ruppel appears again to refer to Oryx. In the letter of that adventurous zoologist, written from Ambukol in Central Africa, he describes an animal from the account of a slave

born at Koldaghi, who states it to be the size of a cow, having the elegant symmetry of an antelope, with reddish hair, a white streak on the forehead and nose, bearing a a single horn on the forehead, long and straight, and the female to be hornless. In Mr. Barrow's travels, we have another figure of the head of an unicorn, which may still be of the present group; and in the collection of original sketches of the animals figured in one of the caverns of South Africa, designed by Mr. Daniell, the group represents very obvious outlines of Hartbeests and other animals, and among them a whole length of an unicorn: but here we find most decidedly a pachydermous creature, such as a rhinoceros would be, if his proportions were reduced into a slighter and more elegant form, and the horn on the forehead lengthened to a slender figure *.

The Romans saw the Oryx in their games as is attested by Martial, and we have shewn that even the straight-horned species was known to the English Heralds of the fourteenth century. In all probability the Dante or Lampt of Leo Africanus and Marmol, figured in the collection of voyages by De Bry, belongs to this group. The White Antelope, with lyrate annulated horns rode by the goddess Chandra in Hindu Mythology, and which appears to be the Ruru of the Sanscrit writings, and of the *Institutes of Menu*, must likewise be referred to Oryx. From an authority not cited, J. Mayor, in the *Ephem. Cur.* viii. (1677), first described the Bezoar as procured from these animals; and Mr. Pennant was well informed when he asserted an Oryx to exist in Egypt, for the figure of the animal is found among the ancient hieroglyphical representations in the tombs of the kings.

* It is to be wished that Mr. Daniell would publish this curious drawing which has a distant resemblance with the Onager Aldrovandi, as figured in Johnston, table xi.

The group is distinguished from others of the genus by its large size, having long horns, common to both sexes: they are slender, without ridges, sharp pointed, and black, with annuli somewhat spirally turned about half or two thirds of their length; the ears are long; the eyes large, dark, and prominent, the suborbital sinus almost obliterated; the nostrils ovine or without a muzzle; the tail, including the tuft, descends to the houghs, and the hoofs are mostly rather broad. The head is narrow if seen in front, and rather square in profile, the horns following the prolongation of the plane of the face; the neck and withers have the hair reversed in most species, and the shoulders are rather elevated; the legs are firm and well proportioned, without tufts on the knees, or inguinal pores?; the females have two mammæ. A mane runs in general along the ridge of the neck turned towards the occiput. The general colours of the group are rufous-grays and vinous yellowish upon a white ground, which predominates more or less. All the species have a streak of white and a darker next it, crossing the eyes, and upon the upper arm and haunch. The species which frequent the woods seem to have the hide of a white colour, as in Aigocerus and those of sandy plains black, although the fur be pure white. The calves are born of a reddish colour, which becomes whiter as they grow up. As species or varieties, this group is dispersed over an immense extent of territory, perhaps from the borders of China, but certainly from the Moultan, through Southern Persia, Arabia, over the deserts of Northern and Middle Africa to Senegal, and south to the Cape of Good Hope. Their great strength and swiftness, aided by their ability to feed on acrid succulents and thorny shrubs, are sufficient to account for the vastness of their native regions.

They live in pairs: sometimes it is said the males have two females, who with their young constitute families of

five or six together. Some species prefer mountains and elevated woody countries; others the plain and sandy deserts, where they seem to subsist with very little water. Strong, active, and vigilant, they repel the Hyæna and the Jackal; they can even intimidate the Lion. If assailed or driven to defend themselves, they raise the tail, couch their ears, toss the head with a menacing look, and with a tremulous and shrill warning snort, drop their head low between the fore-legs, inverting the horns to near the ground, and dart with incredible velocity upon their enemy. Oppian, the modern Arabs of the desert, and the Hottentots, agree in describing the danger of approaching them before they are totally disabled. We have seen spears manufactured by the natives of South Africa, armed with the horns of the Oryx, which proves Strabo's account to be perfectly correct.

In the nomenclature and synonyma of the group, Buffon, Pallas, and other systematic writers, have caused great confusion. Kæmpfer's Pasan or Paseng, the *Capra Ægagrus*, has been confounded with them. Prosper Alpin's figure of the horn of an oryx has been refused an Egyptian origin, and Strepsiceros of Pliny, sometimes referred to the Cretan Sheep, applied to an animal which the ancients have not known, although we shall shew this species under the name of Addax to belong to the group now under consideration, and to have been justly pointed out by Caius in Gesner. Mr. Pennant, impelled by the same desire of ascribing all the references of authors to the species known in his time, most unaccountably considers the Caffrarian or Cape Oryx as the Egyptian Antelope. To conclude: so late as the year 1816, we find the *Dict. des Sciences Naturelles* evincing the obscurity which then still enveloped the present group. It is, perhaps, worth observing, that the Arabs and other natives of the climates which these animals inhabit, never consider them as Antelopes, but as

species of buffaloes*, an idea which they extend to other ruminants usually classed among the larger species of this genus, and which we refer to our genus *Damalis*. The Dutch colonists of the Cape alone have fancied some resemblance between their Oryx and the Chamois of Europe, and named it Gemsebock.

The *Caffrarian Oryx. (A. Oryx.)* The specific name Oryx was most unquestionably bestowed on the wrong animal; for we have seen that Oppian describes it as white with black cheeks, and, therefore, that he understood the Leucoryx of the moderns, and not the species which is now before us. The adult male is about three feet ten inches high at the shoulder, and six feet six inches in length; the horns are straight, about three feet long, annulated two-thirds from their base with from twenty-eight to thirty-three rings. In the females they are smaller, and in old specimens the base is considerably widened; the length often exceeds three feet, but instead of being straight, they have a slight bend backwards, and the tips again forward. In these, the annuli are nearly obliterated, but they are always black, shining, and sharp pointed, placed near the summit of the frontals on the same plane as the face, and not very divergent. The eyes stand high in the head, the colour of which is white with a black space round the root of the horns, descending down the forehead and chaffron, and another passing through the eyes towards the corner of the mouth, whence a band of the same colour passes round the head over the nose, giving the whole an artificial appearance, as if it were a head-stall. In the young and females these marks are neither so distinct nor regular: the ears are rather open, interiorly white and edged with a black line; a black list passes likewise from the

* The Chinese Nicu Kyo Fo or Flying Cow, with one horn only, remarkable for its swiftness and love of salt, is probably an Oryx, if not the Leucoryx or the Kemas.

back of the head, along the neck and spine to the tail, which is of the same colour together with the tuft, and reaches to the houghs; a broad dark band surrounds the upper arm, then passes in a narrower line along the flanks, dividing the blossom colour or vinous yellow of the body and neck from the pure white of the belly, and expanding about the lower thigh into a broad dark space, surrounding the limb just above the houghs. On all the legs below the joints there is another dark space, leaving the rest of the extremities pure white; the hoofs have their points somewhat prolonged, and, together with the spurious hoofs, are shining black.

The Caffrarian Oryx is an animal of remarkable beauty and vigour, inhabiting the mountainous forests and rocky regions of Southern Africa. They live in pairs, are vigilant, and particularly in the rutting season, or when wounded, exceedingly fierce. From the information of a friend, we learn, that having fired at one on the edge of a forest, the animal instantly turned upon his dogs, and transfixed one before he fell. When pressed in their escape towards cover, they will strike to right and left at the dogs with their pointed horns, and often wound them severely; but when they have reached the edge of the wood, they will sit down on their hams, and in that attitude keep the pack at bay. Their venison is said to be the best of any in South Africa.

The female is not more than three feet six inches at the shoulder, and more delicately made. Of the period of gestation nothing is known. We have compared eleven specimens, and a great variety of spoils and horns; the most perfect stuffed one is in the Museum of the Missionary Society of London. There is as yet no good evidence that this species is found to the north of the Equator, although it must have been known anterior to the Portuguese voyage round the Cape of Good Hope, if we admit the

exact representation of the straight horns in the Prayer Book of the Duke of Bedford before-mentioned, as evidence to the fact. This prayer-book was probably illuminated on his marriage with Anne, Princess of Burgundy, and in no case can be later than the period of his death in the year 1435.

The *White Oryx. (A. Leucoryx.)* Mr. Pennant first published a description of this species, derived from a figure of the animal, drawn from life, in the year 1722, by order of Sir John Lock, at that time agent of the Bengal East India Company at Ispahan: several were then kept by the Shah, Sultan Hausein, in his park of Cassar. The traveller, Vincent Marie, noticed another at Muscat, in Arabia, and the species appears to be not uncommon in the province, and even the Island of Bahrein, and along the coasts of the Persian Gulf, Dr. Flemming having possessed one brought from Lesha, the capital of Bahrein. It appears to exist also to the eastward, along the western deserts of the Indus to Candahar, and the Moultan. It is the true oryx of Oppian: the Antholops of Eustathius, sporting on the banks of the Euphrates, seems to be no other; nor can the other names of the middle ages already noticed, nor the Great Goat mentioned in some MS. copies of the Shah Named, be considered as deriving their original type from any other species.

The White Oryx is in size about three feet seven inches at the shoulder, with the head rather thick and square, the neck short, the body bulky, and the legs slender. The horns, as in the former, are placed close together, diverging straight along the prolongation of the face, and the points bending back into a curve; they are obliquely annulated about two-thirds from their base, the tips smooth; they are round, black, and polished, measuring near three feet in length. From the base of the horns, the forehead is covered with a patch of black hair, uniting by a nar-

rower line to a second which spreads over the chaffron to near the nostrils; a similarly-coloured streak passes through the eyes towards the mouth, and often spreads over the cheek and throat; the dark colour appears also in the form of a band on the upper arm, or spreads downward over the fore-legs to near the fetlocks; the hind-legs, from the houghs downwards, are likewise dark coloured, but upwards, on the lower thigh, this colour passes into brown and rufous, till it is blended into the white which spreads over the whole body, neck, and face; the tuft at the end of the tail is black, the ears are long and pointed, and the aspect of the animal is somewhat vaccine.

This species is known to the Persians by the names of *El Walrush* and *Bukrus*. The Arabs name it Ghau Bahrein, or the Ox of Bahrein, from whence it appears to be a stranger in the western provinces of that peninsula*. Their residence is in the desert and sandy districts; we have seen the head of one shot on the west side of the Indus, in the deserts of the Mekran.

The *Nubian Oryx*. *(A. Tao.)* Whether this animal be a distinct species, or only as a variety of the former, we cannot determine, but certain it is that the Numidian forms at least a very distinct race. The adult male is larger, being near four feet high at the shoulder, and seven feet in length from the nose to the insertion of the tail; the horns are three feet four inches long, more robust, more spirally annulated, and equal in their curve the whole length; the anterior part of the nose is more blunt, the neck not so short, the body less clumsy, and the limbs, though finely turned for strength and speed, more bony; the hoofs are low, flat, and not pointed. In the colours they differ also, being all over the body rufous white, that colour predominating chiefly on

* The יחמור *Jachmur*, which, according to Niebuhr, inhabits the mountainous tracts of Arabia and about the Euphrates, the same as the Arabic *Yazmur*, is evidently the present animal.

the nose, temples, cheeks, neck, upper arm, and lower part of the thigh to the joint, and the white over the shoulders, back, flanks, and croup: there is a very slight indication of black above and beneath the eye, but a broad pure white streak descends on each side of the forehead before the inner canthus of the eyes, to the corners of the mouth; the nostrils and legs are white, as also the reversed mane, and the tail, including the tuft, the extremity alone being blackish; the edge of the buttocks, down the houghs, and the anterior part of the thigh, the belly and legs, are likewise of a white colour; the ears are shorter than in the preceding, and white. This description is taken from the beautiful specimen in the Museum of Frankfort, whither it was sent, as we understand, by M. Ruppel, from the interior of Western Nubia, being shot at some days journey's distance from the Bahar el Abiad.

This species or variety is probably the תאו, *Toa* or *Tao* of the Hebrews and Egyptians; it is found portrayed in the hieroglyphic representations in the tombs of the kings, and seems to be also the species designated by the Tuarics and Tibboos near the great desert south of Tunis, as a small white buffalo, swift and fierce when wounded, noticed by Captain Lyon. The Dante or Lant of Congo, figured in De Bry's collection, and described as of the stature of a small ox, sub-rufous in colour, vigilant, active, and bold, is perfectly applicable, and the notice of Leo Africanus still more so. He represents it as a species of ox, but smaller, with more elegant horns and legs; of a white colour and with black hoofs; so exceedingly swift, that a Barbary horse alone may overtake it: more easily caught during the summer heats, because the hoofs wear on the burning sands and impede its speed. We must remark here that the references to the size of cattle in Central Africa are arbitrary, several breeds being small. The colours of rufous and white are both applicable to the animal, and

we may add that Buffon, in noticing the above passage of Leo, seems to have been misled by a wrong comma, making the legs of the animal, instead of the size, less than that of an ox.

The *Algazel**. (*A Bezoastica.*) This is, perhaps, a third variety, though M. F. Cuvier considers it a species. If this opinion be correct, it follows that the animal described by him under the above name, being a native of Western Africa, has usurped the specific appellation which should have been conferred upon the foregoing according to Zoologists, because that is known on the banks of the Nile, while this appears to be more confined to the regions of the Niger and Gambia. M. Schreber first published a figure without a description, under the specific designation of *A. Eleotragus* which is in reality that of the Rietbock or *A. Arundinacea.* The Icon itself may be referred to the present species, though the pale bluish and rufous tone of the colouring and other particulars, might prove it to be intended for the female of Leucophæa†. Professor Lichtenstein first pointed out the probable identity of this supposed *A. Eleotragus* with *A. Bezoastica*, and M. F. Cuvier seems to have been of the same opinion. To the latter gentleman we owe the only accurate account of the species.

The Algazel is very considerably less than the former species, being only three feet five inches high at the

* Al gazl is evidently misapplied, as Gazl signifies a young deer, a roe, in fact the true Gazelle; but modern Zoology has affixed it to an oryx.

† A horn in the possession of Mr. Parkinson is very like those in this figure. It is compressed, more bent than those of Bezoartica, about twenty inches long, slender, black, not quite complete at base, but retaining twenty-seven obsolete annuli; the lower dichotomous and with striæ between them, the superior third, smooth, and pointed. It does not belong to Oryx, but may be of the female of Leucophæa.

shoulder, and five feet two inches long. The horns are about three feet long, close together at the base, black, round, slender, bent back, the lower half annulated with thirty-six rings, not spirally ascending, but separate; the forehead is narrow, the head long, with a small lachrymary sinus not much developed, beneath the eye: on the neck and back a low ridge of reversed hair, and the colour of the body fulvous-gray, whiter on the back; the head white, with a dark spot at the insertion of the horns, descending down the nose, and another passing through the eyes; the tail white, with the termination of the tuft dark: this description was taken from a male which lived in the Menagerie of the king at Paris, where we made a drawing of it in 1819.

The animal wanted that elegance and vigour in its proportions so conspicuous in the Numidian species: in captivity it was gentle, or more properly, spiritless, almost sluggish. The ears, which in comparison to the former were long and pointed, usually hung in an horizontal spreading direction; the Museum received it from Senegal, where it was said to be rare, and imported from the interior. From the specific name this should be the Bezoar, bearing animal: but we have already stated our opinion that the former is, in truth, the animal which naturalists intended to honour with this title; and as these concretions are in all probability not more the property of one than the other species, and the medicinal virtues of the Bezoar not the object before us, we shall leave the consideration to pharmacy, its proper place. We presume it to be the species met by Major Denham south of the river Shary.

Count de Buffon figures a horn without rings, but in all other respects belonging to this group. We have seen a similar horn in the hands of a dealer at Leipsic, three feet

PETIT ADDAX.

THE BROAD-BOOTED ANTELOPE.

Vat. Myotragus.

six inches long, perfectly smooth, bent as in the former, and in volume something more considerable. These may belong to an unknown species, but it is presumed that they are mere indications of age, with, perhaps, the aid of art; and as we have now before us a horn of the Caffrarian species nearly in the same state, this conjecture acquires the weight of certainty.

With the Orygine group we class a subordinate racemus; more anomalous in characters, but still osculating with it by the position of the horns on the frontals, their length, slender form, and terminal point, and their community to both sexes—the insignificance or absence of the lachrymary sinus—the ovine nose, large stature, and even by the marks on the face,—yet assuming other characters which lead to the succeeding groups.

The *Addax*. (*A. Addax.*) The first impression on seeing this animal is that of an oryx with spiral horns, and upon examination this impression is not weakened, although Caius in Gesner, de Capris Silvestribus, figures the horns, and assigns them, with justice, to Strepsiceros. Nomenclators have, in this instance, misplaced that name, and given it to one which the ancients appear not to have known: the words of Pliny prove that he did not mean the creature of Southern Africa, at present distinguished by that designation, and still less that he meant to indicate the Cretan Sheep. His (Cornua) "erecta rugarumque ambitu contorta et in Lævo fastigium exacuta, ut Lyras diceres," is not perfectly applicable to either of the above, but completely to the animal before us. Hence we have no hesitation in adopting the name of Addax, which the Roman naturalist gives as the local one of his Strepsiceros, and in adopting on this head the opinions of Professor Grætzmer. Shaw seems to have known only the horns of

his Ledmee, and may, therefore, be suspected to have mistaken this animal for the true Antelope, although it must be owned that their length of two feet is no objection, and that there are grounded reasons to doubt the exclusion of that species from Africa. In the zoological part of Messrs. Denham and Clapperton's Voyage, the Addax is clearly mistaken for *A. Cervicapra*, for the Arab name El Buger Abiad, or White Cow, at once reveals it.

The Addax differs from the true Oryges by having the croup somewhat more elevated than the shoulders, and by a lengthened mane on the neck, and a tuft of hair beneath the throat. Its stature is about three feet seven inches at the shoulder, and three feet eight inches at the loins: the horns are equally robust in both sexes, black, round, divergent, slender, with thirty-two or thirty-five annuli, some of the lower dichotomous, extending upwards three-fourths of the length; they form two and a half spiral turns, with an obsolete groove on the internal side, obliterated midway towards the point, which, with about five inches of surface, is smooth, sharp, and turned outwards: they stand close at the base, near the summit of the frontals, on the same plane with the face, five inches in circumference at the root, two feet four inches long, in a straight line, and nearly the same distance between the tips; the eyes are prominent, and without a lachrymary sinus; there is a dark-coloured mane on the neck, hanging in various directions, and a heavy, coarse, and long tuft of black hair upon the larynx; the head is thick, the forehead flat, covered with frizzled black hair, surrounded by a narrow white line, descending from above the eyes, and meeting on the chaffron, then passing obliquely before the inner canthus of the eyes to near the mouth; the nose is ovine, and, with the lips and chin, white; the ears long, hairy, and of the same colour; the region about the orbits, the chaffron, cheeks, and neck, are of a deep liver-coloured gray, pass-

ing gradually into white upon the shoulders, from whence the whole animal, including the tail with its terminal tuft, and the legs, are milk-white ; the limbs are firm, and rather stout; the hoofs low, flat, round, and black, resembling somewhat those of the Rein-deer: the tail does not reach to the houghs. The female has two mammæ, no inguinal pores, and appears, in all other respects, like the male.

The first indication of this species occurred to us in 1819, while viewing the Museum of Bourdeaux, where we found a horn of Addax, which was there mistaken for one of Cervicapra, and had been brought from Senegal*. Upon the measurement and description of this fragment we established the species, and found it fully confirmed in 1824, when the complete specimens were placed in the Museum of Frankfort. We are indebted to the liberal institutions of that splendid establishment, formed by the public spirit of the lovers of science in that city, and in particular to the kindness of Professor Grætzmer, for the means of drawing and making measurements of many new and interesting zoological specimens. Several of both sexes of the Addax were sent from Nubia by M. Ruppel. It appears that they reside in pairs on the barren deserts; their broad spreading hoofs seem intended to facilitate their progress over yielding sands, and their powers enable them to extend over the whole Zahara, so as to be found as far west as Senegal. Along with the above specimens we found the complete spoils, skin, and skull of a calf, which it is presumed belonged to this species, and was obtained at the time with the female, whose mammæ indicate that they had milk when she was shot. This little creature is higher on the legs than an adult goat, with hoofs very low and flat, the horns little more than an inch long, and the colour of

* Dr. Caius communicated to Gesner a drawing of the head of this species, though it has been mistaken by zoologists for that of *A. Antilope.*

the hair pale rufous. It resembles a new-born Guernsey calf, and might, indeed, be the young of the Nubian Oryx.

The *Chiru. (A. Kemas?)* The Kemas of Ælian is only characterized by horns with the point turned forwards, a hide very thickly set with hair, and a white tail. Naturalists, viewing the direction of the points of the horns as a decisive criterion of groups, have mostly placed this species among the Reduncæ, and considered it an African species, without adverting that the quantity of hair and the colour of the tail removed it from any known animal of this genus, belonging to that quarter of the globe, or even from those of Asia hitherto described. No ruminant of a low latitude, or residing beneath high mountains, is furnished with a superabundant coat of hair; and thus we are led to look for the Kemas of Ælian among those remote from the tropics, or whose habitat is confined to elevated regions, and to consider it as still undescribed in the catalogues of nomenclators. Assuming the foregoing data, a late discovery in the mountains of Central Asia shews us an antelope in which the indications of Ælian are obvious; we mean the Chiru or Unicorn of the Bhotes. From the accounts which we have received, and the inspection of the horns by a friend, we are enabled to present a notice of this animal sufficiently distinct to establish it as a species, the probable Kemas of Ælian, and to indicate its presumed affinity with the Orygine group, at least until subsequent observation shall have confirmed or invalidated the opinion.

The materials from which the notice is collected, consist in the description of the skin of a male to which the horns were attached, but mutilated and distorted from the want of skill or of means in the natives who procured it, and also in several horns sent from Katmandoo to Calcutta. From these it appears, that the total length of the animal approaches to six feet, and the height at the shoulders is more than three feet. The horns are from twenty-one to

twenty-six inches long, black, slender, annulated with rings, most prominent towards the front, and extending three-fourths up the horn, the rest smooth and pointed; they are seated on the crest of the frontals, parallel to the plane of the face, close at base, divergent; their general direction between straight and lyrate, and the tips turned forward; the head is ten inches long, seemingly without lachrymary sinus, and without a moist muzzle; the ears are short; the neck, compared with the body, very long, if at least this seeming disproportion be not the result of overstretching that part; the fore-legs and withers are lower than the croup; the tail is eight inches long, and shaped as in the Axis; the hair of the animal is rough and very thick, but not quite so hard or long as in the Musk, with much of the same quill-like character: it conceals a fleece of fine soft wool, set very close, and pressed against the skin: the colour of the face and legs is dark, nearly black; the neck, back, and sides, blue-gray slate colour, turning to rufous on the back; the belly, inside of the thighs, and tail, are whitish; the distinctive characters of the female are unknown.

We have here another instance of wool on the skin of an antilopine species; a character not only perfectly consistent, but of necessity, when the animal resides in high latitudes, or on high mountains: thus a similar cause produces a similar effect upon the A. Lanigera of North America, the Chiru of Central Asia, and, indeed, on the Chamois of Europe. This wool is so abundant, that in the notice sent from Katmandoo*, it is described as perfectly similar to that of the Wild Sheep of Bhote. It is probable that the residence of this animal in the same regions, and sometimes in company with the Thibetan Musk, led the

* A MS. extract, for which I am obliged to J. E. Gray, Esq., of the British Museum.

Arabian and Bysantine writers to consider it as the musk-bearing animal; and this error was the more likely to occur, as they might have known the Mongolian Dzeren (*A. Gutturosa*), who is actually provided with a pouch. Of all the antilopine animals, the Chiru is the one which corresponds best with Ælian's Kemas*; and if we consider that although the species is described at present as found in the Bootan, the mountain ruminants are more likely than those of the plain to spread along the ramifications of central ridges as far as they can find a congenial climate. There is no reason to deny its former and probably present existence, even in the Caucasian range, and to have come within the inquiries of Ælian, during the military expeditions of his time (that is of Alexander Severus) into the mountains of Armenia†. The species might still have remained unnoticed in the elevated wildernesses of Central Asia, if the people of the country had not asserted it to be the Unicorn, and since the specimen is produced, insisted that it is often found with only one horn. No doubt all the Oryges are liable to break one of their horns, when we consider their length, small diameter, and the vigour and courageous disposition of the animals; and we may infer that the reports of Monocerotes so ancient, so universal, and so permanent, depend solely upon these accidents; and that the

* Although the word Kemas, Κημας, appears a genuine Greek term for a young ruminant, the derivation seems rather far-fetched, and it is, possibly, in common with other Greek terms, derived from the more ancient Oriental root *Kem*, which, with its mutations, signifying summit, crest, &c., extends over the Old World. There is a curious connexion between the ancient names of the great ranges of mountains and of ruminants. Thus Taurus, and Taurus a bull; Himalaya, Hemala a ram, the Teutonic Hamel; Imaus, and Hæmus and Kemas; Caucasus, and Ghau-cas, or Oxridge; Coomri, and Komri, a doubtful Hybrid of Central Africa, &c.

† Ælian's description of its swimming and residence in woods is more appropriate to Asiatic than African locality.

A. subulosa. nob.

A. Acuticornis Blain.

Tetracerus quadricornis

Anoa Depressicornis nob.

Damalis Gunna nob.

Oryx Kemas ?

Ant. Melampus

BIBLIOTECA

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Unicorn Chiru of Bhote is, in all likelihood, the Unicorn of the ancient Persians.

According to the accounts of the natives, this species resides in the most inaccessible pine tracts of Chandang, north-west of Digurgu, in the Himalaya mountains, on the verge of the snow, and evinces great activity and vigilance. They associate sometimes with the Musk, and with the Nervati, or Wild Sheep of Bhote. Mr. Hodgson, assistant resident of the East India Company at Katmandoo, first produced the documents for a description of the animal; there were, however, already some accounts of it transmitted in a letter from Captain Smith, who commanded a party stationed in the eastern parts of Nepaul. In the Calcutta *Oriental Miscellany*, are the dimensions of the skin, before noticed, and communicated, we believe, by Mr. Hodgson. Total length of the animal five feet eight inches; of the head ten inches; of the ears four inches and a half; of the body four feet two inches; length of the neck one foot nine inches; of the fore-leg one foot eight inches; of the hind-leg one foot eight inches and a half; of the tail eight inches; circumference of the head one foot eight inches and a half.

It appears, from the information of friends, that the term spiral horns, which was at first assigned to it, refers to the annuli, which are absolete, excepting in front; and from the figure shewn us, we are inclined to consider a horn in the collection of Mr. Parkinson, attached to a part of the frontal, and formerly belonging to the Leverian Museum, as of this species. It is about twenty-seven inches long, measured upon the curves; black, slender, very slightly lyrated, parallel with the face, bending outwards towards the middle, and the tips turned forwards; marked with twenty-one annuli, most prominent in front, striated between, and with about five inches of the summit smooth. It is seated on the crest of the frontals, and may have been the horn which induced Mr. Pennant to describe his Cine-

reous Antelope, or Eleotragus of Schreber, as having the points turned forward. We had placed it in the group of Oryx, with the surmise that this referred to Kemas in our original catalogue. There is, however, a slight difference, the present having a small lateral bend, which we hear does not exist in the Chiru. If, therefore, it does not belong to the Bhote species, it is a fragment of one not as yet described.

The Gazelline Group.

Of the great genus Antilope, there appear to be two parallel lines of affinities, descending, with trifling interchanges of subordinate characters, down to the lower groups included in it. The first with horns in both sexes, passing from the Aigocerine racemus, through the Gazellæ, and the second from the Oryges, through Antilopedes, to Reduncæ, Cervicapræ, Cephalophi, Neotragi, Tetraceri and Raphiceri, till we arrive at those which depart from the slender structure of the former, and gradually assume more the characters of Capra and Ovis. In connecting, therefore, the series by the gradations of character, either might be selected, as through the Addax a natural passage is formed to the Spirally-horned Antelope and through Oryx or Kemas, a similar osculation takes place with Pallah; but as in the groups of Antilope, and their connecting links, the females are hornless, it may be deemed preferable to follow in the first instance the Aigocerine series, by means of *A. Pygargas*, through the Gazellæ, and then taking the Antelopes connected, both with the Oryges and Gazellæ, immediately after them, continue that line till the Antilopine type becomes confounded in the Caprine. The Gazellæ have the females provided with horns, and the structure of these arms, particularly in the larger species, offer curves more decisive indeed, but still of a similar primitive direction as in the Aigoceri. The annuli are

most prominent to the front, but they are placed lower down the frontals, nearly above the orbits, bending more outwards, and the tips turn in general again forward, so as to assume the shape of an ancient lyre, when the head is seen in front. This instrument may be regarded as originally composed of the horns, and the frontals connected with the celebral cavity of the skulls of Antelopes, the strings being passed from a cross-bar at their tips to some part of the molars in the upper maxilla, or to a second bar thrust across the orbits: this primitive form may be recognised in all the subsequent modifications of the ancient lyre.

The Gazellæ have the bony cores of the horns solid; they are provided with a small lachrymary sinus, and with inguinal pores; most of the species have tufts on the knees, a streak of a dark colour, set off by a lighter streak through the eyes, and a dark band separating the darker teints of the flanks from the white of the belly; the inside of the ears is mostly marked by several dark lines, occasioned by the absence of hair, which is placed in rows, and of a white colour; their eyes are prominent, dark, and soft, and it is to this group in particular, that the complimentary allusions of the oriental nations is confined; the nose is ovine; the females have four or two mammæ developed, and the tail is short and furnished with a dark tuft.

The larger species live in families or herds, but the smaller are all gregarious, keeping at a distance from wooded scenes, and residing principally on the barren deserts; these, however, they will quit in the night, to approach cultivation, and it is said, that in the desolated provinces of Abyssinia, they are fond of resorting to the fields, where the result of former agriculture has left abundance of grain growing wild, to seek cover and food, and thus concealed, they are hunted with difficulty. The Arabs and Bedowens of Africa and Western Asia, some-

times shoot them by watching their approach to the springs, or hunt them by contriving to get suddenly among a herd, and throwing a heavy stick horizontally at the nearest, and generally breaking the legs of one or more. The nobles in Persia, and the wealthy Turks and Moors pursue them with the Hawk, or slip the Cheetah or Seer-ghqosh * to surprise them ; but in all these cases, even when the Hawk is flown, it is necessary to circumvent the quarry, unless the herd is so large as to exceed the bounds of alarm, or it would be labour in vain to reach them. Although they feed most about dawn and twilight, wandering travellers sometimes come suddenly in the night upon a herd, and it is observed, that if no dogs be present, they will scarcely rise and go further than a short distance to lie down again ; but if unusual noise disturbs them, the whole trot off and evince symptoms of anxiety till the return of day-light. During the ill-fated expedition to trace the course of the Zezeere or Congo, the devoted travellers saw many herds of Antelopes of various and new species, chiefly belonging to this group, some of which were obtained, but only a few trifles and short notes reached England †.

The *White-faced Antelope. (A. Pygarga.)* This species is the largest of the group, retaining somewhat of the Aigocerine aspect, but marked by a most singular intermixture of colours. In height at the shoulder, it is superior to the Stag of Europe; the horns placed subvertically on the frontals, a little above the eyes, are bent, first convexly or to the front, then slightly concave, the points being turned upwards; they are black, extremely strong, with ten or twelve semi-annuli on their anterior

* Cheetah Felis Venatica, Seehar or Seer-ghoosh, (head or chief thief,) the Syagush or Persian Lynx ; it also signifies long ears.

† Dr. Smith's notes were sent to his relations at Christiania, and those of Mr. Cranch are unfortunately in a particular short hand, hitherto undeciphered.

side, separated by striated intervals; their length is from twelve to fifteen inches, and their circumference at base seven inches; about two inches of the point are smooth. They are seated on a fiery rufous patch of hair, larger in some, and in others, divided by a white streak which passes down the whole length of the face; the ears are long, reddish outside, and white within; the sides of the head, neck, throat, shoulders, upper arm, flanks, croup, and thighs to near the joint, are of a deep brownish-purple, or sanguine colour; but it is remarkable in this species, that the back and upper part of the shoulders appear as if a heavy bluish-white was glazed over the purple under tone, forming a broad space in the shape of a saddle: this mark is separated by the deep-purple on the flanks, from the pure white which extends over the belly; the anterior and internal side of the thighs, the inside of the arms, the breast, legs, buttocks, and tail, are likewise white, a short dark-coloured tuft at the end of the last-mentioned only excepted; the legs are clean and firm, with small hoofs exceedingly black. The largest specimen we have seen, measured three feet eight inches at the shoulder, and was full six feet long: the distinctive characters of the female are doubtful. Among nine specimens, the horns and colours, independently of those whose sexual characters could be distinguished, were all nearly alike, and appeared to be of males, though it is possible that among the mutilated, some were females: yet according to Shaw, the horns of the females are nearly smooth.

This animal does not seem to be known in Central Africa. It is found in the regions bordering upon the colony of the Cape of Good Hope, and within the frontier about Swellindoun and *Breederivier*; among the Dutch colonists it is distinguished by the name of Blessbock, descriptive of the white mark on the face; and the Booshwaanas name it

Nunni. Their manners are somewhat akin to those of the Gnoo, living in families of seven or eight; and further north, even in small flocks. There is a variety which we have seen, brought from the Boochwaana country, in which the white colour on the buttocks is not observable, but the white legs remain equally pure as in the others, and the purple and glazed colours of the body are still more brilliant.

The *Broad-hoofed Antelope. (A. Mytilopes.)* Dr. de Blainville is the only author who has published a notice of this species under the name of *Antilope Neztache** (*A. Naso Maculata*), from a specimen in Mr. Bullock's late collection, and now in the British Museum; but his description is very imperfect, no doubt, from the impossibility of obtaining a close inspection of his subject. It is a female evidently allied to the former by several characters, but considerably smaller, being only four feet two inches in length, by two feet eight inches at the shoulder; the croup two inches higher. The head is nine inches long, concave between the chaffron and forehead; the horns, one foot in length, have the same direction as in the former, but the flexures are less strongly marked; they are round, black, annulated, with thirteen or fourteen rather indistinct rings extending little more than half way up, the rest smooth, standing on a square spot of a vivid rufous colour; the ears are six inches long; the suborbital pore not perceptible, and the nostrils with a small dark space or muzzle between them; the rest of the forehead, region about the eyes, passing into a broad bar under the ear, and into another bar

* This specific denomination appears very objectionable, because the animal is possessed of distinctive characters much more essential, clearly marked, and applicable to it alone; whereas the spot on the nose is faint, of the same colour as the cheeks and sides, and therefore no spot.

before the eyes, the lips, under jaw, breast, belly, all the legs, the thighs, and croup, are white; the chin is furnished with bristly hairs, and of the same colour, as also the tail, the end of which is mutilated; the chaffron, cheeks, neck, shoulder, flanks, hips, and part of the buttock, are fulvous-ochre colour; the withers and back a whitish-gray, glazed upon the under teint, forming an ephipiform spot similar to the preceding; the ears are white within, and very pale fawn on the outside. There are small naked callosities below the knees, and a dark-brown spot embraces the insertion of the spurious hoofs; but the broad, flat, muscle-shaped hoofs, expanding nearly an inch laterally, and terminating forwards in two long and rounded points, distinguishes this species from every other. In this species four mammæ are developed, and it is probable that the same character extends to Pygargus. The body is heavy compared with others of this group, and the form of the hoofs indicate a peculiar mode of life, perhaps on the sandy deserts, as we have seen something similar in the Addax.

We understood the specimen to have been brought from Guinea, or at least from Western Africa. The male is as yet unknown, but it may be conjectured, that, excepting in stature, more robust horns, and a more brilliant coat, little difference will be found between them.

The *Red-necked Antelope. (A. Ruficollis.)* There is so much similarity in the distribution of the colours, and even in the horns, between this species and *A. Dama*, that their possible identity requires an osculating location among the Antelopes. The species under consideration is about three feet high at the shoulder, of a light and elegant structure; the head rather broad across the orbits, tapers to a small mouth with ovine nostrils; the horns are near twelve inches long, with thirteen or sixteen small annuli, the superior third smooth; they are lyrated, with the tips turned inward and forward; beneath the eyes there is

a small lachrymary sinus; the ears are above six inches long, and the tail is short, and terminated by a tuft. Exactly upon the knees, there are brushes of a peculiar structure, being formed of two rows of stiff bristly hairs, perpendicular upon the edges of the joint, and turning inwards, which meet and lie close on the middle of the knee. The head is white, with two spots of bright rufous hair at the base of the horns, descending on the forehead to the commencement of the chaffron; the ears inside, and at the base of the outside, are white, from the middle upwards rufous, and the tips black; the neck, shoulders, and back, to the loins, are whitish rufous, darkest on the neck, but leaving a white spot on the throat; the rest of the body, breast, limbs, and tail, excepting a rufous spot on each of the fore shanks, are milk-white, so that in this species the saddle-shaped space on the back differs from the former in the colours being reversed; the tail is terminated by a tuft, but does not reach below the hams.

The female is a little smaller; the horns are less curved, particularly at the points, which, in the male, bend strongly to the front: the rufous colouring is also paler, and there is a little blackish-gray upon the larynx. We found only two mammæ in this species; the inguinal pores were large, naked, and bright yellow; the spurious hoofs very small, the pasterns high, the true hoofs small, low, pointed, and black *. This beautiful species resides on the barren wastes of Nubia, where the specimens were procured by M. Ruppel, and sent from thence to the Museum of Frankfort.

The *Swift Antelope. (A. Dama.)* Count de Buffon described this species under the name of Nanguer, from a skin brought by Mr. Adanson from Senegal. The speci-

* With the haste of a traveller I omitted to note the number of incisor teeth, but believe they are as usual eight. If Pallas be correct respecting Dama, this would constitute a difference.

men was two feet high, three feet nine inches in length; the colour reddish-dun on the back and neck; the head, ears, belly, flanks, tail, and legs, white; a dun streak ran down the fore-legs from the knee to the fetlocks. There was a rufous spot at the base of the horns, and a large white spot on the throat; the horns were about seven inches long, black, round, bent back, and the points turned forwards; the annuli, if any, were indistinct. In this description, the inferior stature, small horns as yet without discernible rings, the rufous colour on the fore-legs, &c., bear evidence of nonage, this being the semi-adult of the former; but whether Pliny meant this species by his Dama, is more doubtful, because in the adult, the flexures of the horns, though terminating with the point forwards, are not more so than those of the Kevel, which it is more likely that he knew. It is equally questionable whether Ælian meant this species by his Dama, which undoubtedly is as swift an animal as any of the genus, and, therefore, well named by Mr. Pennant, but still it seems not likely that the ancient naturalist should have characterized the fleetness of its course by a comparison with the awful velocity of the whirlwind.

Dr. Pallas observed that this species has only six incisor teeth, but if the statement be correct, it may be accidental, there being in the Royal College of Surgeons another head shewing only six alveoli, but, not being provided with horns, it cannot belong to the same species, and there being only five molars in the upper jaw, with other evident signs of nonage, the circumstance may be entirely owing to the youth of the specimen. Mr. Adanson found the Nanguer * in Senegal; if his specimen and Ruficollis be the

* Adanson's names of Nanguer and Nagor *(passim)*, are evidently different modes of spelling and pronouncing the Bornou, Engry, and Begharmu Ngria, which, according to Denham, signifies Gazelle.

same, the name of the latter must of course be struck out of the list, and Dama alone retained; and it follows also that then the species will extend from the Nile to Senegal.

The *Springer Antelope. (A. Euchon.)* This beautiful animal is the largest of a small subordinate group, several of which seem to have been noticed by the ancients indiscriminately under the name of Dorcas, originally applied to the Roebuck. The Springer resembles the Dorcas of nomenclators, but is nearly a third larger in size. The head is rather short, with somewhat of the expression of a lamb; the neck is slender, the body comparatively bulky, and the legs slender and elegantly turned. In common with the rest of the Dorcades the croup is more elevated than the shoulders; this conformation appearing to increase in the inverse ratio of their stature, for Pygargus has the line of the back horizontal, and Corinna and Cora the croup most raised; Mytilopes shews it in a small degree, and the Springer more. Independent of the difference of relative size, we may take the greater development of the hind quarters as an index of the comparative powers of bounding and velocity of motion: but the character most remarkable and unique in the Springer, consists in two folds of the skin ascending from the root of the tail, and terminating upon the croup; they dilate when the animal is bounding, and expose a large triangular space, otherwise concealed, of pure white-coloured hair, edged by two dark streaks, which form the covering borders. The general colour of the hair is a pale fulvous dun; the face, mouth, inside of the ears, breast, belly, posterior part of the legs, tail, and croup, within the above-mentioned space, white; the end of the tail is furnished with a few black hairs; a broad dark-brown band divides the white from the fulvous along the flanks, from the elbow to the hip, and another separates the white colour of the buttocks, ascends on the edges of the folds on the croup,

and terminates in a point upon the ridge of the back, at the junction with the band from the opposite side: a small dark-coloured streak passes also through the eyes, or commences at them, and reaches down to near the nostrils, and the horns are placed on a bright fulvous scalp; these are robust, and handsomely lyrated in old males, with about twenty narrow complete annuli, and the tips turned inwards or forwards. In the females they are slender, and the annuli less prominent. It is to be remarked of this species, that while the males are young, and their horns shew only twelve or fourteen annuli, the points generally turn forwards; but in proportion as they increase in length, the apex turns more inward, and the annuli assume the form of large wrinkles. This observation proves the anterior uncination of horns to be either insignificant or a transient distinction in many species, and in all probability is equally applicable to *A. Dama.*

The Springer is known among the Dutch Colonists of the Cape by the names of Spring Bock and Pronk (showy) Bock*. It resides on the plains of South Africa, to an unknown distance in the interior, in flocks, assembling in vast herds, and migrating from north to south, and back with the monsoons. These migrations, which are said to take place in their most numerous form, only at the intervals of several years, appear to come from the north-east, and in masses of many thousands, devouring, like locusts, every green herb. The Lion has been seen to migrate, and walk in the midst of the compressed phalanx, with only as much room between him and his victims as the fears of those immediately around could procure space by pressing outwards. The foremost of these vast columns are fat, and

* The Caffer name Tesbe has a singular resemblance to the Hebrew Tzebi, which is commonly understood to designate the Dorcas.

the rear exceedingly lean, while the direction continues one way; but with the change of the monsoon, when they return towards the north, the rear become the leaders, fattening in their turn, and leaving the others to starve, and to be devoured by the numerous enemies who follow their march. At all times, when impelled by fear, either of the hunter or the beast of prey, darting among the flock, but principally when the herds are assembled in countless multitude, so that an alarm cannot spread rapidly, and open the means of flight, they are pressed against each other, and their anxiety to escape, impels them to bound up in the air, shewing, at the same time, the white spot on the croup dilated by the effort, and closing again in their descent, and producing that beautiful effect from which they have obtained the name of Springer and Showy Bock.

Though Sparrman seems to have first described it in a satisfactory manner, the species must have been known, and even brought alive to Europe at a much earlier period, there being a good representation of this animal in a picture of the Creation by the Velvet Breugel, who died about 1689. We have compared six male and two female specimens. It appears that albinism sometimes affects the colour of the fur, for in Paris there is a specimen of a white colour, retaining, nevertheless, the dark bands on the flanks and croup, the streak near the eyes, and the fulvous spot on the region of the horns, but the horns seem never to have been developed, although the individual is somewhat larger than the usual size: there is also a slight indication of rufous on the arm and on the hind-legs, and the tips of the ears are black.

The *Persian Antelope.* *(A. Subgutturosa.)* The Dorcades are considered by many eminent naturalists, and seemingly with some reason, as including within one species, the Subgutturosa, the Dorcas, the Kevella, and Corinna. There is, in truth, so much similarity in their size, horns,

Cap. Semilunata nobis

Ant. Adenota. nobis

Gaz. Mytelopes nob.

Gaz. Subguttarosa

W. Hamilton Smith. Esq.r del.t

and markings, that it will, perhaps, be necessary to obtain these species collectively, and to compare them more minutely in their habits, than has been done, or can well be effected by the casual examination of living individuals and stuffed skins; but if they be of the same species, we think, nevertheless, that they form, most decidedly, distinct races, which inhabit the same countries, but seldom or never intermix, and that the presumed identity may be ascribed, in a great measure, to their general resemblance, most particularly in the transition of nonage to maturity These remarks are, however, only in part applicable to the Persian Antelope, whose habitat is confined to a range of latitude where snow is found, at least, during some period of the year, and whose characters, in several particulars, are sufficiently remote from the others to be considered as a separate species.

This animal is known to the Persians by the name of Tzeiran, and to the Turks by that of Jairan. In size it is about the same as the former, measuring three feet seven inches in length, and above two feet at the shoulder. The horns of an old male are from thirteen to fifteen inches long, measured upon the curves; they are grayish-black, lyrated, from the base spreading forwards and outwards, then bending inwards turn their points again outwards and backwards, and sometimes into a hook: they are marked with about nineteen rings, some of which are interrupted, extending two-thirds of the whole length, and leaving the points smooth. In the skull there are no openings or void spaces between the nasal and lachrymal bones, and the superorbitary perforations are small and single, not double or triple, as in other Antelopes: such are the characters of a skull in the collection of Mr. Brooks. M. Guldenstædt, however, in the *Act. Acad. Petrop.* describes the horns of his specimen as shewing the basal annuli very close, and the others more separated, and almost obliterated at the

back; in ours they are distinct all round, and the middle rings only divided by small intervals. The eyes are large, dark, and soft; the ears long, straight, and marked with the usual triple striæ; the tail is about five inches long, lined with distichous hairs, and the larynx is prominent, protruding in the form of an egg; the colour of the hair is fulvous gray; brown on the upper parts of the body; the face ochery; a brown mark occupies the middle of the nose, and a whitish line each side of the chaffron, succeeded by a dark streak from the inner canthus of the eyes to the corner of the mouth; in old specimens these marks are effaced: the lips are blackish; the throat and legs pale ochre colour: there is a darker band on the flanks, sometimes separated from the colour of the back by a paler streak; the tufts on the knees are of a mixed whitish and black hairs; the tail and hoofs are black; the hair of the back is near two inches long. The females have smaller horns; they are destitute of lachrymary sinus and of tufts on the knees; their mammæ are placed on a naked surface, and the inguinal pores distil a scented substance.

This species is an inhabitant of the open sandy plains and hills of Northern Persia, Asia Minor, Southern Siberia, and the shores of Lake Baikal. It is gregarious, and feeds in preference on the *Absynthium Ponticum*. The Persians and Tartars hunt it for the savoury venison it affords, both with the Hawk and the Cheetah. We presume this to be the Brown or Mountain Gazelle of Russel and Haselquist, reported to be so fond of the smell of tobacco, as to approach shepherds while reposing with their pipe, and come almost in contact. This species would then be found as far south as Aleppo, but probably only in the colder season.

The *Barbary Antelope. (A. Dorcas.)* The *Barbary Antelope*, or Δορκας of Ælian, is the غزال Gazal of the Arabs, and, perhaps, the צבי *Tzebi* of Scripture. It is in stature a little less than the Roebuck; the horns are round, black,

lyrated, about thirteen inches long, annulated at base, semi-annulated in the middle, with twelve or thirteen bars; the points smooth and sharp, slightly turned forwards, and the sides of the horn striated; the forehead and chaffron form a slight concavity, rufous in colour, with a little black in the middle, separated by a white or fawn-coloured streak, extending from the orbits to the nostrils, and succeeded by another white and black streak, passing from the inner angle of the eyes towards the nose; the lower half of the orbits, and part of the cheek, are likewise fawn coloured, or whitish; the inside of the ears is marked by five alternate streaks of white and black; the eyes are remarkably large, black, and beautiful; and the mouth and inside of the nostrils are black. The general colour of the animal is pale fulvous, reaching down the anterior and external side of the legs; the lips, nose, breast, belly, inside of the thighs, posterior part of the legs and buttocks, white; the tail is short, furnished with a tuft of long black hair; a broad dark-brown band separates the fulvous of the side from the white of the belly; there are small tufts of hair below the knees, and inguinal pores in the groin: the female is furnished with more slender horns, whose points are turned inward, and with two mammæ. We have examined thirteen individuals of both sexes of this species, several of which lived in the Menagerie of Exeter 'Change. They were all brought from Barbary and the Levant, the Dorcas seeming to be confined to the north side of the Atlas Mountains, Egypt, Syria, Arabia, and Southern Persia: they are gregarious, from choice or necessity, keeping on the open and often desert and sandy plains, approaching water only once in twenty-four hours, and that in general at the dawn of day.

The *Kevel.* *(A. Kevella.)* This species or variety, when fully adult, is equal in size to the Dorcas, distinguishable from it by the head being a little more lengthened, and the

facial line straighter; the horns are considerably more robust, laterally compressed, longer, the flexures more complete, with from twelve to twenty annuli extending nearly to the summit, and the points bent forwards slender and sharp; the orbits are larger; the eye still fuller, and of an hazel colour; the white space round the eye is broader, and the same colour extends to the under jaw; the colours on the forehead and chaffron are fulvous, and the streak on the inner angle of the eyes fulvous-brown, with no really black intermixture; and though the disposition of the colours of the hair in other respects be nearly similar, the white of the buttocks is usually divided from the pale fulvous of the thigh by a faint darker streak, even when no dark band is seen on the flanks, which seems to be the sign of old age.

It appears that the Kevel is not found on the north side of the Atlas, unless it be on the west coast of Morocco: it forms large herds along the plains of Central Africa beyond the river Congo, and probably as far south as Caffraria. In Mr. Burchell's private collection we saw a skull belonging to the female of either this or the young male of Corinna; for, notwithstanding the resemblance, the female of Euchon is readily distinguished. We have compared two living and five stuffed specimens of the Kevel, and particularly one old with the oldest among the Dorcas, and our inferences are in favour of the opinion that they are distinct species. The horns of the female are almost straight, excepting at the tips, which turn inwards; they are slightly compressed, and marked in front with seven or eight half annuli; the number of mammæ the same as Dorcas.

The *Corinna. (A. Corinna.)* The third questionable species is the Corinna, confounded on account of its close affinity with the two former, which is indeed so near, that the young females of the latter, and especially of Kevella, are mostly placed in the collections of Mammalia for specimens of the

Corinna. Mr. Adanson's original description, noticed by Buffon, appears to be the sole document which can be relied on, Professor Lichenstein, justly observing that the specimens referred to in cabinets, including Buffon's, are all females. M. F. Cuvier's more recent description and figure relates to the same sex, and is taken from one brought to France, from Senegal indeed, but so young that the horns have not as yet sufficient development, and the markings retain their juvenile character: it may, therefore, be considered as a female Kevella, and ranked with the other specimens as before observed; but although the genuine Korin of Central Africa is not among the articles exhibited in Europe, it does not follow that there is no such creature; the question merely resolves itself into, Whether the Korin be a separate species or a constant variety or race of the Dorcas and Kevella, resulting from a long residence on the most barren plains and the most scorching climate. The Korin, or Corinna, does not approach the coasts of Western Africa, but is exclusively confined to the plains of the interior bordering on the Sahara. The late captive and traveller Adams alludes to this species "with slender straight horns and dark bands on the flanks, running in troops on the desert."

The only specimens which can, however, be fairly referred to Corinna, were exhibited alive in London; both the male and female, by the development of their horns, proved that they were adults. The male was not so large as the Kevel; the horns more recumbent at their base, slightly tumescent at first, were regularly lyrated, but with less contour in the curves, and about seven inches long, closely wrinkled beneath, and with slight risings in the middle, but not sufficiently prominent to decide either wrinkles or annuli. The points were turned a little inwards, they stood not very close at the base, a little above the orbits, and were bent outwards towards the summits

more than in the Dorcas or Kevella; the nose and mouth were white, which colour passed upwards to and round the eyes; the chaffron bright fulvous, as also a small space between the eye and nose separating the white line from the cheek; the forehead, back of the ears, cheeks, neck, back, outer part of the upper arm, and middle of the thigh, were sandy or pale ochre, fawn mixed with a little gray towards the flanks; the inside of the ears marked with three streaks; the breast, belly, inside of the limbs, anterior pasterns, anterior edge of the thighs, buttocks, the whole hind-legs and under part of the tail, were white; small darkish tufts protected the knees of the male; the upper part and tuft of the tail, which was still shorter than in Kevella, were blackish, and a chestnut-coloured band ran along the flank. The female was smaller, similarly marked; the horns shorter than the ears, seemed to have only a few swellings on their surface, the points, however, were turned inwards; both had very slight indications of a lachrymary sinus, their hoofs were very small and black; they were rather corpulent when compared with the usual lank appearance of this group, but too timid and liable to injury for more accurate investigation. We made sketches of this pair, which was said to have been kept some time at Sierra Leone before they were brought to Europe, and it was added that the fawns are spotted. We should not hesitate to consider these as the Korin of Adanson, if we had been able to ascertain the exact nature of the wrinkles on the horns, which, according to him, should amount to sixty; but they were distinctly marked only at the base of ours, and whether friction in captivity might not have obliterated them on the upper parts, we may presume but cannot positively determine.

The *Cora.* *(A. Cora.)* There existed a pair of small Antelopes in the tower of London, one of which was afterwards stuffed and preserved in that establishment; they

were male and female, said to have been brought from India, or more properly from the Persian Gulph; they were taken for Corinnas, but shewed distinguishing characters which make this opinion very doubtful. The male was equal in size with Kevella; the head round, with the nose and mouth small, tapering, uniting to the forehead by a concave line. The specimens were both young; the horns, not much developed, stood upon a middle line between the orbits; they were about four inches long, in the female, suberect, the points slightly bent back, smooth, round, without striæ, black, and pointed: instead of annuli a circular groove marked about the third of their length. It was near three feet two inches long, twenty inches high at the shoulder; from the nose to the horns five inches, and from the nose to the occiput seven inches and an half; the ears four inches, pointed wide in the middle, and furnished with three white striæ on their inner surface; the suborbital sinus not perceptible, and the nose ovine. A dark streak passed through the eyes towards the nose, and a second from the base of the horns to near the nostrils; the forehead and chaffron were bright rufous; the mouth and nose white, as also the space between the two dark streaks, passing over the eyes to the back of and under the orbits; the occiput dark-brown; the cheeks fawn-coloured; the outside of the ears, neck, throat, shoulders, back, thighs, and outside of the legs yellowish-rufous, or rust colour; the breast, belly, inside of the limbs, anterior part of the thighs and buttocks, white; a dark streak on the flanks; on the knees, perhaps from confinement, there was a small callosity; the tail, five inches long, was furnished with long black hair, and the anterior face of the pasterns to between the hoofs shewed a tuft of dark-brown hair; the pastern joints were very long, the hoofs small, pointed, and black, and the croup was considerably higher than the shoulders.

These individuals, though not adult, were in size above the Corinnas, before described, and larger than Mr. Adanson's noted dimensions; their colour was much more red. The two black streaks on each side of the face, and particularly a more anterior position of the horns, seem sufficient to warrant a separate place being assigned them, even if their native country were not so far east as Persia or Eastern Arabia. We have but one suspicion relating to them, which is that they might be the young of *A. Gutturosa*, but in that case the species would inhabit a latitude as hot as that of Barbary, as well as countries abounding in snow, which is not likely. Under these impressions we propose the provisional name of Cora* as a distinguishing designation, leaving the question of identity to be settled by future investigation. It were to be wished that, instead of multiplying the species, those described might be compressed into fewer, and clearly established as mere varieties of age or locality: but there is an equal impropriety in being swayed by a desire either way so long as every circumstance connected with this history is not fully developed, and we certainly are still far short of that end: these observations apply to the whole of the minor group. Kevella appeared to us as the old adult of Dorcas, but having since seen that species with only eleven whole and half annuli, though the horns had the bolder flexures and compressed character assigned them, and Dorcas with fourteen complete and half rings, but the horns round and more developed, we have returned to the more ancient opinion that they are really different species.

The Antelopine Group.

This racemus is nearly allied to the former in manners and habits, in the general structure of its forms, the number of mammæ of the females, and the inguinal pores;

* Cora, a κορη, *puella*.

but less obviously so in the lateral bands of darker colour, and in the greater expansion of the suborbital sinus. It differs in the horns, never being truly lyrated, often subspiral or spiral, and in their total absence in the females. The group is likewise distinguished by an incipient muzzle or small moist space between the nostrils, destitute of hair, and all the species are more elevated at the croup than at the shoulders. As in the former, the larger species live in families or small flocks, on various ground, but the smaller herd in vast numbers exclusively on the open plain, concealing themselves only during parturition in high grass or weeds. The component species are spread over nearly the whole of Africa and partially on Eastern Europe and the plains of the west, and middle, and chiefly Southern Asia. Among animals of such delicate conformation no great vigour of character is to be expected; yet the males of some species have, at least, the pugnacious spirit of jealousy, and expel the weaker from the herd, retaining a degree of viciousness even in confinement. Acuteness of scent is a common property of the genus, but most particularly the attribute of this group; some of which appear to possess this organ communicating with the suborbital sinus, and to consult it on all occasions. If bread be offered them which has been handled, they will reject it; the flavour of an orange is agreeable, for they will not only smell it with the nostrils, but, willing to flatter themselves still more, they apply the suborbital pores in like manner, and seem to inhale the odour with great pleasure.

The *Pallah.* *(A. Melampus.)* This beautiful species was first figured and described by Professor Lichtenstein, who obtained a specimen during his travels in Caffraria. It is placed at the head of this group, because it is the largest. The horns have a lyrate tendency, and the females are represented by Mr. Daniel, as being without them. If

that sex had horns, the place of the Pallah would be after Mytilopes and before Ruficollis in the former section, because there is much similarity in the distribution of the colours with the latter, and in the dark spot on the spurious hoof with the former. It is an animal of majestic and graceful form. The horns of the male are at least twenty inches long, bending outwards and midway, forming an obtuse angle with the base, the upper half being turned inwards; they are strong, black, striated, prominently and ruggedly annulated, with about seventeen rings ascending two-thirds of their length, the rest smooth, and the points sharp; the height at the shoulder is above three feet, at the croup about two inches more, and the length nearly five feet. It stands high on the legs, and has a long neck; the ears are about seven inches long, white inside and on the edges, fulvous outside, and black at the tips: between the nostrils there is a bare pale coloured moist space; the mouth and lips are white, this colour passing upwards with a fawn-coloured tone round the eyes; the forehead is brown, softening into fulvous on the chaffron, and expanding this colour over the cheeks, with a dark streak below the orbits; the neck, throat, and sides, are fulvous, turning to a deeper brown upon the back and rump; the breast, inferior part of the shoulder and thighs, the belly, buttocks, inside of the limbs and legs, are pure white; a black streak, sometimes double, separating the rufous from the white on the buttocks, but a dark streak running along the spine, not always perceptible; the tail, about eight inches long, is white, and without terminal tuft; but above the spurious hoofs, at the back of each leg, there is a black spot; the hoofs are small and black, and the whole animal is a model of elegance and vigour.

The females are represented without horns, but with the ears still longer than the males; they are nearly similar in the distribution of the colours, but the rufous is less vivid.

The Pallah inhabits the interior of Caffrarea, and particularly the Booshwana country, never appearing, according to Lichtenstein, south of the Koosges Valley. They live in small families of seven or eight.

We compared the figures of Professor Lichtenstein and Daniell with three skins of males, and several heads and horns, all so nearly alike, as to prove that this species is not the Koba*; the angular bend in the horns being constant in all, and the distribution of the colours the same. In the Berlin specimen the black spots on the legs descend lower, and are larger than in those belonging to the Burchellian collection or the British Museum, and it was from these particular spots that the learned Lichtenstein drew his specific name of Melampus.

The *Gambian Antelope. (A. Forfex.)* This name, first established by Mr. Pennant, and by him applied to the Kob, is, however, of a doubtful nature, as it respects the species we have to notice. Gmelin joins the Lerwia or Teshtal of the traveller Shaw to it; but in order not to mislead the judgment, it is necessary to produce the characters, such as the original authors of these names have established them, and compare them with the description of our species taken from a living specimen. Mr. Pennant characterizes it thus: "horns thirteen inches long, five inches and a half round at bottom, pretty close at the base and points, very distant in the middle, surrounded with eight or nine rings, smooth in the upper part." This description is evidently taken from a pair of horns alone. Dr. Shaw, however, copying Gmelin, likewise adds the Lerwia, which is described by his namesake the traveller, as of the size of a heifer, is provided with a long mane, tufts of hair five inches long round the fore-legs, and re-

* Koba, it will be seen, belongs in all probability to our genus *Damalis.*

curved horns. These characters would refer to a larger animal (more likely to be the Takhaitze of Daniell, if there were no other considerations which we shall notice in the genus *Ovis*), but most clearly exclude it from the Gambian Antelope described by Mr. Pennant.

The specimen which we refer to the Gambian was kept in the Menagerie of Exeter 'Change, and there confounded with the rest of middle-sized Lyrated Antelopes. It was a male, larger than the Springer, being about twenty-five inches at the shoulder, rather bulky of body, but with much resemblance to Kevella. The horns close at the base, slightly bent forwards, then opened widely outwards, and their points again turned inwards, and slightly forwards; they were black, round, annulated, with twelve complete rings, the upper third smooth and pointed; when seen in front, they represented the figure of a forceps, and measured about twelve inches on the curves; the head was broad across the orbits, measuring ten inches in length, and terminating in a small mouth with white lips, and a black shining muzzle between the nostrils; the eyes were full and dark, surrounded by a white space, and beneath them was a long lachrymary sinus; the ears were rather large, open, and slightly pointed, lined with close white hair, and from the orifice filled with a bunch of long white and gray hairs, hanging out of their conchs between two and three inches in length*. The face, cheeks, back of the ears, neck, shoulders, back, croup, sides, external face of the upper arm, thighs, rump, houghs, and anterior face of the hind-legs, were fulvous-dun, darkening into yellowish-brown on the face and buttocks; the tail, about six inches long, of the same colour, with a black line on the middle, and a tuft of black hair at the end, the inferior part white;

* This character is also perceptible in Mr. Pennant's figure of the head, but his description of the horns is more conformable to ours than to his figure.

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THE WOLF.

A ADENOTA. Hamilton Smith.

this colour, spread also over the throat, breast, belly, anterior part of the thighs, and inside of the limbs, legs, and fetlocks: between the dun and white on the flanks there was a darker line not very distinct; a dusky streak passed down the front of the fore-legs, terminating in a dark spot on the pastern joint, and small brushes of the same colour protected the knees; on the hind-legs the dusky space reached only a short distance above the pastern; the hoofs were small, black, and pointed.

Its aspect was peculiarly soft and engaging, but it was uncommonly shy. We understood it to have been brought from the west coast of Africa.

In the Museum of Mr. Riddel there was a stuffed female in a recumbent attitude, which belongs to this or the following species. The head was hornless, ten inches long, round about the forehead, and tapering to a prolonged small muzzle; the suborbital sinus open and dark; the eye-lashes long and black; the ears lengthened oval, lined with much white hair. Its total length three feet eight inches, assumed height at the shoulder twenty-two inches, and at the croup twenty-five inches; the nose, forehead, back of the ears, neck, back, croup, and anterior part of the legs, fulvous; sides of the head, neck, shoulders, flanks, and thighs, sandy-ochre colour; a spot above the eyes, mouth, throat, breast, belly, and inside of the limbs, white; no streak, but a dark spot on each pastern; tufts on knees stiff, curling, dark-brown; two mammæ: it was evidently not quite adult, and came from Africa, we believe from Sierra Leone.

The *Kob? (A. Adenota*.)* The animal designated by the name of Kob, is known only from the skull and horns in the Museum of Paris. Mr. Adanson first noticed it, and

* Uncertain whether this is the Kob, we wish to distinguish the present specimen by the gland on the back, αδην, *glandula*, νωτος, *dorsum*.

Count de Buffon drew up his account from the above fragment, with the additional information, that in Senegal it was known to the French settlers by the appellation of Petite Vache Brune. The horns are large, black, marked on the first two-thirds of their length with seven or eight half rings; the posterior and lateral sides striated: they form only one single curve to the front, and the points turn towards each other; the head is narrow, long, and without depressions for the lachrymary sinus. This description shews already a sufficient difference in the horns to separate the former species from Kob, but whether the following will be deemed satisfactory and identical with Adanson's specimen, is more questionable. The inference, however, appeared to us sufficiently grounded.

In the Menagerie of Exeter 'Change there was a pair of middle-sized Antelopes, like the former, supposed to belong to the lyrated group. The horns of the male were seated above the orbits, at base nearly vertical to the plane of the face, then bending back, and the tips almost imperceptibly forwards: they were above nine inches long, robust, black, striated, a little compressed, with the semi-annuli only on the anterior part, prominent, ten in number, the superior third smooth, but not sharp-pointed; the shoulder was about twenty-six inches high from the ground, the back arched, and the croup one inch higher; the head long, pointed, with a small black muzzle; the lips, under jaw, and space round the eyes, white; the ears long, open, with the usual dark streaks on the inner surface; the head, back of the ears, neck, back, flanks, outside of the fore-legs croup, thighs, and hind-legs, fulvous bay; a small gland or tubercle on the loins, about equi-distant from the hips and root of the tail formed the centre, round which the hair of the body whirled or feathered in a circle, couching forward on the back, and upwards on the neck, obliquely over

the flanks, downward over the hips, and backward towards the tail; the belly, internal face of the fore-legs, anterior and internal side of the thighs and fetlocks, white; a dark list ran in front of the fore-legs, terminating near the hoofs; a black lengthened spot surrounded the hind-legs above the spurious hoofs; the tail was short, entirely covered with long black hair; the suborbital slit was long and open; small black brushes covered the knees, and the hoofs were small, pointed, and black. The female was smaller, horn-less, but similar in the gland on the back, the direction of the hair, and distribution of the colours; both were excessively shy, and difficult to approach. They were brought from the west coast of Africa.

We have here three successive instances of dark spots near the succentorial hoofs, a resemblance further maintained in the suborbital openings, the long ears, rufous colours, and small muzzle; but the identity with Kob would not have been obvious, if, after the death of the male, we had not obtained, from the politeness of Mr. Pettigrew, permission to make drawings of the skull then in his possession, and thus to establish the only comparison that could be deemed satisfactory, with the figure of the skull in the works of Buffon. Although the living objects just described were still young, the similarity is striking, and differs only where they differ in age. The horns of our specimen, when seen in front, resemble the points of a field fork, opening from the base, and bearing the summit nearly parallel; the skull is narrow across the orbits; the super-orbitary perforations on the frontals are triple on one side, and only double on the other, each in one common cavity; the nasal bones are divided from the lachrymary by a single lengthened void; the lachrymary are not hollowed out to the depth that appears in others, and the nasals are remarkably long. We conjecture, when the lachrymary bones are not greatly depressed, and a suborbital sack is, never-

theless, extant, that it is very open outwards, other instances of the same structure having been detected. In proof of the almost nonage of the subject, there were only five molars in each of the upper maxillæ, the last narrower than the third or fourth, and all the sutures were very distinct.

The *Saiga. (A. Colus.)* The name Saiga, which appears to be a Sclavonic pronounciation of the Teutonic Zeiga, or great, is applied to an animal truly Antilopine; and although it be found in Europe, is one of the most rare in cabinets of natural history. There are specimens, we believe, in the cabinets of Petersburgh and Vienna, but no other, that we know of, can shew more than the horns. The male has been figured by Pallas, and it is to be regretted that he did not likewise publish another of the female. Of all the Antelopes, none, if we except the Chamois, has been described so early as the Saiga. Strabo, in his *Geograph. L.* vii., clearly noticed it under the name of Κολος; Gesner and Johnston likewise described the Colus; but Pallas, to whom we are indebted for a complete account of the species, preferred to latinize the vulgar name, and was followed, in this respect, by all the more modern writers *.

The horns of the Saiga assume an intermediate form between the lyrate of the Dorcas, and the spiral of the Common Antelope; they are distant at base, about ten inches long, round, erect, wavy, in three curves, perfectly annu-

* We think the animal's having a proper and classical name, used by Strabo and Gesner, a sufficient apology for not following the denomination of Pallas; there are, nevertheless, other reasons; Saiga is the Russian name of the *female* only. Saiga is Tartaric for the Wild Ox; and in the many dialects of Eastern Asia is the most vague of all those bestowed upon ruminants. The Polish name Sulok is, no doubt, the ancient Sclavonic term, from whence the Greek Kolus, which presents the letters reversed, is derived.

lated to near the summits, which are turned inwards; their colour is yellowish and diaphanous. The animal is in size nearly equal to the Fallow-deer, measuring more than four feet in length, but not harmoniously proportioned, for the head and body are heavy, compared to the delicacy of the limbs; the nose has a turned arched form, the nostrils are open, wide, and moist, that part being wholly cartilaginous, as the nasal and vomer bones are never entirely ossified; this rare structure furnishes the exquisite sense of smelling possessed by the animal, and also causes it to graze backwards or sideways; the ears are narrow, middle-sized, and the tail short, being only four inches long, and naked below during the summer, with a tuft at the end: at this season the colour of the hair upon the back and flanks is gray-dun, with a dark streak along the spine, and white upon the belly; in winter it becomes more hoary and longer, so as to appear whitish at a distance; the lips are provided with numerous bristly hairs; and the legs, which are of a pale dun colour, have small tufts on the knees, and black pointed hoofs.

This species resides on the shores of the Danube, south of the Carpathian range, on the uncultivated parts of South-eastern Poland, Little Russia, along the Black Sea, round the Caucasian Mountains, the Aral and Caspian Seas, to the east about the Irtish, the Ob, and the Altaic Chain, being confined to the north by the thirty-fifth degree, or less. In all this extensive region the soil is nearly everywhere steril, sandy, and salt; supporting mostly Absynthian, Artemysian, Atriplecian, and other bitter and saline plants, many of which are evergreen; these, together with the brackish water of pools, afford the principal sustenance of the Saiga, and communicate their flavour to its flesh, which, however, is considered not unpalatable in winter, but rejected in the summer, on account of the numerous Œstri, probably of a particular species, which infest and

pierce the skin, and give it a putrid smell. The females have the hair softer, and are hornless; and the males are themselves subject to vary in this particular, some having been found with three, and others, it is said, with only one horn.

The manners of the Saiga are sociable and migratory, especially in the autumn, when they assemble sometimes to the number of ten thousand in a herd and travel towards more southerly deserts: in the spring they return in small flocks or troops. They are unwilling to reside far from water, are seldom seen single, and the herd, when in a state of repose, always keeps a few stationed to look out; even when domesticated, this instinct remains. They see indifferently during the day, are weak and resigned when beset, and although their speed is exceedingly great, they are soon exhausted, stopping to recover breath, and perish with the slightest wound. It is reported that, like sheep, they incline on one side in their course; they have a bleating voice. Strabo had observed with truth that they drink by the nostrils, but erred when he added that they retain water in them. Towards the end of November the males become pugnacious, as this is the commencement of the rutting season. They then smell of musk, and the most powerful buck drives the weaker from the herd, and keeps the females to himself, with jealousy and even with courage, to defend them against wolves or foxes. Parturition takes place in May, it is usually confined to one kid which at first is covered with a curling fleece-like wool. The young males grow rapidly; their horns appear in the first month.

They are gentle when domesticated, but for this purpose they must be taken young. They will go to the fields and return without desiring to escape, know the voice of their masters, and feel gratified with his caresses. In the hay and provender they pick out the leafy plants and re-

fuse the gramineous and buds of shrubs. The Wild Saiga are hunted for their horns, which are an article of commerce with the Chinese, who manufacture them into lanterns: the winter hides are likewise useful and the flesh. For this purpose both hounds and eagles are used, but the hunters must approach them from leeward, and be without red or white clothing. Eagles and wolves hunt them also for their prey, and, indeed, are their greatest enemies. In Poland the Saiga is known by the name of Sulak, and in Russia by that of Mangatch, the female being the Saiga. In the Tartaric dialects it is commonly Saijak, and the Turks name them Akim.

The *Dzeren.* (*A. Gutturosa.*) The Dzeren of the Mongolian Tartars, Tzeiran and Jairan of the Persians and Turks, was mistaken by Buffon for *A. Leucophæa*, through a figure of the horn of the latter animal being placed at the head of the article Bezoar of Oldrovandus. The name, indeed, appears generic in the East, for the Dzeren of the Mongols is not the Tzeiran of the Persians, who designate by it, the Persian Antelope or Subgutturosa. The Chinese Antelope, or Dzeren, is like the former, heavy in body, with a short thick head armed with yellowish but opaque horns*, or as others assert, with equal probability, black horns; they are about nine inches long, completely annulated to near the tips, reclining backwards, diverging, wavy, and the points turned inwards. The nose is blunt; the lips set with long hairs; the ears small and pointed; but one of the chief characters of the animal is a large

* We found the horns ascribed to the Saiga and the Dzeren in the Prague, Munich, and Dresden Museums. If there be no mistake in the tickets, Shaw, who states them to be yellow, is correct; but it might be that they all belonged to one species (the Saiga), the smaller opaque to the young, and the larger diaphanous to the adult. Gmelin reports them to be black, and he cannot well be mistaken: the truth may be that the colours vary.

moveable protuberance in the throat, occasioned by the dilatation of the larynx, appearing externally clothed with long stiff hairs pointing forwards: in old males it is so much enlarged as to look monstrous. There is also under the belly of the male, near the prepuce, a glandulous bag, somewhat similar to that of the musk, which may have caused the old opinion that the Thibetan Musk was a horned animal; but in this bag there is no odoriferous substance. The suborbital pores are small; the females are hornless, and smaller than the males, who measure about two feet six inches at the shoulders, and nearly four feet six inches in length. In the summer both are of a fulvous yellow-gray above and white beneath; in winter they are almost white; their knees are furnished with short brushes, but not lengthened tufts as in the Dorcades; the tail is short and terminated by a dark tuft.

The species is found in Mongolian Tartary, in the deserts between China and Thibet, in Eastern Siberia, and principally on the great sandy desert of Cobi. It avoids woody places, preferring the arid stony open plains and barren mountains. It is gregarious, assembling in vast herds towards autumn, approaching the vicinity of habitations in winter, and sometimes mixing with the cattle, feeding on herbs and grasses, and rejecting the bitter and saline plants. The Dzeren is equal in swiftness with the Saiga, less easily fatigued, and in its course making surprising bounds. The rutting season occurs later than in the former, and the females drop their kids in the middle of June; these are of a slower growth, but equally tameable when taken young. In a wild state this animal fears water so much, as to suffer itself to be taken, rather than enter it; but if falling into a river by accident, is said to swim well. Wood and forest are equally an object of terror with them, probably from a conscious feeling that their bounding speed will cause them injury, and, in fact, if they be driven among trees,

they soon strike against them, and are disabled. According to Du Halde they are known in China by the name of Hoang, or Wang Yang (Yellow Goat).

The *Common Antelope. (A. Cervicapra.)* We now come to the most celebrated species in the whole genus, not less remarkable for beauty of form and elegant distribution of colours, than for the interest it has excited from the remotest antiquity among the nations and philosophic legislators of the regions where it resides. They have raised the Common Antelope among the constellations, harnessed it to the chariot of the moon, and represented it as the quarry of the gods. In the opinion of Hindoos the animal is sacred to Chandra, female devotees and minstrels lead it, domesticated, by the harmony of their instruments, or the power of their prayers, and holy Bramins are directed to feed upon their flesh, under certain circumstances prescribed by the *Institutes of Menu* *.

The Common or Indian Antelope is styled the Spotted or Ena in the ancient language, and Sasin or Sasi by the modern Hindoos. It is smaller than the Fallow-deer, with a lengthened head, ending in a rather full and round mouth, surmounted by a small moist muzzle; the eyes are full, soft, and dark-hazel, with a well-defined suborbital opening beneath; the ears middle-sized and pointed; and the horns, placed a little above the orbits, are from fifteen to twenty inches long, which, as the animal advances in age, become more and more spiral, though when younger they have little more than three flexures. They begin to appear on the young males at the age of seven months, shewing the second year one slight bend, increasing the spiral curve when they have two, which takes place at three years of age, and twelve or thirteen rings are numbered on their

* The Antelope, as we have before stated, is sacred to Chandra or the Moon, is depicted in the Indian Zodiack instead of Capricorn, and placed in the hands of Mahadeva Pancha Mukti.

surface; but when they have attained three years, they contain about twenty-two complete rings. In more advanced age they thicken, at the base a succession of half annuli or wrinkles are seen, and they are sometimes two feet long; the spiral turns are then perfect, so that after death, if the osseous core within be dry, they can be screwed on and off with ease. The colours of the hair vary likewise with age: while young they are of a pale fulvous, more or less ochery, with white about the mouth, inside of the ears, breast, belly, inside of the limbs, buttocks, anterior part of the thighs, interior and posterior part of the upper arms, and the rest of the legs; a white streak passes also about midway of the fulvous along the flanks; there is sometimes a dark streak in the form of a crescent passing round the anterior part of the eyes next the forehead; when older, the white increases on the nose, forms a circle round the orbits, extends on the lower jaw and throat, and the legs often become entirely white, excepting the tufts on the knees, which are always brown; the tail, about five inches long, is likewise white beneath, brown or fulvous above, and without a tuft at the end. But the fulvous colours darken gradually, the forehead, back of the ears, top of the neck, superior part of the tail, and the middle and lower part of the thigh, to beneath the joint, alone remain fulvous; the chaffron, cheeks, throat, sides of the neck, shoulders, back, croup, and flanks, deepening into a sepia-brown, and the streak on the middle of the flanks becomes intense black, with a second of the same colour some inches lower on the edge of the white colour of the belly. It is at this period that the colouring is complete, and the term *spotted* is applied; they are then of a growth and maturity to claim a herd of females, but there are individuals, and they are the most vigorous, which become nearly all shining black and white, the fulvous being wholly obliterated; these have the horns wrinkled and solid as before noticed, and

never more than one male so marked is seen in a herd, the leader and champion of the females and the young *.

The females are without horns, and assume the same colours till they acquire the tawny or fulvous coat, which is about their fifth year, when a white streak gradually shews itself on each side of the spine, but they never acquire the dark garb of the males. There appears to be in India no fixed period for copulation. They are gravid nine months, from which considerable longevity is to be presumed. One kid is produced at a birth, too weak to rise from the ground for some days; at length it is led out from the cover by the dam, and follows the herd till the third year, when it is expelled by the jealousy of the leading buck, to wander at some distance, exposed to the grasp of the Tiger, or the weapons of sportsmen. Thus left to their own resources, many perish; the others become vigilant, and even bold. Most of the specimens procured are males of this class, but many precautions are necessary to capture them, so great is their vigilance and distrust.

We have seen several individuals together, both at Exeter 'Change and in paddoks of gentlemen. The males are inclined to be vicious at certain seasons, but the females are remarkably gentle: they lived all together peaceably with deer and sheep, walking occasionally round their fence, then skipping more rapidly, and, at length, bounding with great force and velocity; they shewed much curiosity, came towards new objects, even when terrified, and it was generally after reconnoitring something strange that their gambols commenced. Similar habits had already been observed by Pallas, in those kept at the Menagerie of the Stadtholder of

* According to Kevenot not more than five or six are led (not followed) by a male, and several of these families together make a herd. He, too, names them spotted, or like our *fawns*, which last expression makes it doubtful whether he is not speaking of Hog-deer.

Holland. Mr. Pennant remarked in this species what we have witnessed in some kinds of Deer, that they apply in smelling, not only the nostrils, but also the suborbital opening, especially to a grateful scent.

This species resides in India in herds of fifty or sixty does or females, led by a dark-coloured buck. They remain invariably on the open plains, so as to see danger from a distance. Captain Williamson and other sportsmen state, that when a herd is collected to lie down and ruminate on some favourite spot, the young males and some females are detached two or three hundred yards each way to keep watch, especially if there be clumps of grass or bushes, behind which a man might lurk unseen, except for such a precaution. "It is folly," continues this well-informed sportsman, "to slip greyhounds after them, for, excepting by surprise, success is not to be expected, but, perhaps, at the expense of their lives." The height and distance of their bounds are wonderful, and said to be at least twelve feet from the ground, and over twenty-five or thirty feet of space, and as it were for their own amusement, appearing to deride such dogs as follow them. The chase, therefore, as an amusement (for the venison is dry and lean) is conducted by the Mahomedan and Hindoo princes, with hawks who fly at and fix their talons on the head and throat of the quarry, till the dogs can come up; or with the Cheetah, by surprise, as is also practiced in Persia*. They are found over the whole peninsula of India, to the northward and westward as far as the Indus; but as they do not resort to the sandy deserts, it is probable that they extend along the more fertile uplands of the Persian Gulph, particularly

* They are caught also, by means of slip knots attached to the horns of a decoy male, who, going up to the herd, is soon encountered in sport by the young males coming to play with him, and are entangled by the horns, and readily captured.

as we have been assured that our Indian travellers met them near Basora, on their way home over land.

As further illustrations respecting this interesting animal, we possess copies of two Indian paintings; the first representing a female of the highest Bramin cast, bearing the Been, a stringed instrument, on her shoulders, and inducing her tame antelope to follow, by holding out her beads; the second portrays an Indian and his wife, of the hill tribes, approaching an old antelope under cover of a shield of green leaves, the woman ringing a bell, while the man shoots it with an arrow: in both, the figures of the animal are spirited, and correctly drawn *.

Whether this species exists in Africa, is a question hitherto uncertain; we have shewn that the Lidmee of Shaw affords no decisive evidence, because he may have mistaken the horns of Addax for those of the true Antelope. Zoologists must not, however, expect to find this species on the deserts of northern Africa. The banks of the Nile, the Niger, and the cultivated tracts along the coast alone, could have been inhabited by them; and at present the western part of Morocco appears to maintain a breed. In support of this probability, we have in our possession the drawings of a male and female now in the Museum of Philadelphia, reported to have been brought from Mogadore, in that county. The pair are larger than the Indian variety, two feet seven inches at the shoulder, in their structure more robust; the horns of the male about eighteen inches long, in a straight line, very spiral, have at the base nine or ten close and small semi-annuli, reaching two inches high; above these are fourteen or fifteen complete rings, and the smooth end is short and strong. The pair diverges less than the Indian, are more bulky, though shorter, and of a

* Copied from a book highly ornamented and painted with Indian subjects, formerly presented by a native Prince to Warren Hastings, Esq., and brought home by him.

deep brown colour. From these characters it is evident that the specimen is old, yet the colours on the fur are not the same as in India, for they are rufous-brown, or deep tawny, without lateral streaks all over the animal, excepting the nose, mouth, space round the eyes, a spot on the throat, breast, belly, inside of the limbs, buttocks, and inferior part of the tail, which are white; there are small tufts on the knees, but none at the end of the tail; the female is without horns, with more white on the nose, no spot round the orbits, but one below them, and none on the throat, and the fulvous parts paler: this description agrees with the extracts quoted by Buffon from Marmol and Shaw.

Beside the above, we made a drawing of a third specimen in the Philadelphia Museum, which, we believe, was brought at the same time from Morocco, and was viewed by Mr. Peel as a species he could not refer to a known Antelope. It may, however, be presumed to be a younger specimen of the former. The height at the shoulder was less than the foregoing, the neck, body, and whole structure, more slender, and the head narrower; the horns about eight inches long, are almost straight, being only slightly wavy, seven or eight annuli mark three-fifths of the lower end, the rest is smooth and pointed, and the colour earthy brown; the lachrymary opening is scarcely perceptible; the whole head, back of the ears, neck, back, anterior part of the fore-legs, flanks, croup, thighs, and hind-legs, are pale tawny; the throat, breast, belly, inside of the limbs, anterior part of the thighs and buttocks, are white; a faint indication of a dark line separates the two colours on the flanks, and on the croup; the tail is short, dun above and white beneath, with a dark tip, but no tuft; the brushes on the knees scarce developed, and the hoofs low and black.

Of Antilope Cervicapra we have noted, compared, and sketched above thirty specimens, living, and in the stuffed

form, beside a multiplicity of horns and skulls; among the horns there are sometimes specimens perfectly smooth, and larger than those usually seen. Professor Lichtenstein, and others, have suspected them to belong to an unknown species; they are joined together with opposite points, to form a kind of cress worn in the girdle of some Mahomedan sectaries, who profess not to bear arms.

The Reduncine Group.

The Antelopes of this group, distinguished principally by horns more or less bending forward, begin to recede from the elegance and fine proportions of the previous sections; they form a separate racemus, distinguished by the character of the horns, which are placed behind the orbits, but little reclined, mostly short, round, black, and annulated half way up, or less; their ears are long, open, oval, filled on the inside with white hairs; they have no externally developed suborbitary sinus; the nostrils are ovine, or in a small muzzle; the fur on the hides, which are white or black, is larger, looser, undulating; the tails reach below the buttocks, and are thickly set along the edges and tip with long loose hair, but no tufts; their limbs are strong and lower in proportion than in true Antelopes, and their residence requires them to have more power in springing than fleetness, for they prefer open rocky mountains, or the cover of reeds and bushes along the banks, or the beds of desiccated upland rivers. The females are without horns, and provided with four mammæ; they are not gregarious, but live in pairs, or small families of six or eight. The Kemas of Ælian would seem to refer to this group, or to be, as we shall find again in the next, intermediate; but that, and the chain to which we apply it, must ultimately be decided when the Bootan species shall be better known.

The *Rietbock*. *(A. Eleotragus.)* Mr. Allaman first described this species from the notes and a skin forwarded to

him by Colonel Gordon. It has since been further described by Professor Lichtenstein and Mr. Barrow, and Mr. Burchell brought the spoils of several with him from Africa. The Rietbock is full four feet six or eight inches long, two feet ten or eleven inches high at the shoulder, and more than three feet at the croup; the ears are above six inches long, and the tail between nine and ten; the horns are from ten to twelve inches long, recumbent beneath the plane of the face, divergent, regularly curved, with the points forwards, or rather upwards; they are black, wrinkled at base, and annulated with obscure and imperfect rings in the middle; the superior third smooth; the head is ten inches long; the eyes black; the suborbital pores not visible; the nostrils with small muzzle of black colour, but sometimes white; the colour of the fur is in general of an ashy-gray, tinged with ochre; the ears, lips, throat, breast, belly, anterior and internal side of the thighs and arms, white; the hair of the throat long and pendent; a blackish edge passes round the tip of the ears, and the tail is mixed with rufous and white at the end; the anterior and external side of the legs are ochery, and the rest white. This species is either monogamous, or resides in small families, among the reeds and bushes of dried river courses, and along the edges of springs, in the interior of Caffraria. We have compared five specimens. The females are smaller, and hornless, but resemble the male in colours and figure.

The *Nagor.* *(A. Redunca.)* This species is known only from Mr. Adanson's specimen and Count de Buffon's description; there are indications about it which create a suspicion that it is the young of the following or only a variety. It is described as above four feet long, two feet four inches and an half at the shoulder, and two feet eight inches at the croup; the horns are short, black, straight, with one or two rings almost smooth, and slightly

bent forwards; no suborbital openings nor muzzle are mentioned in the description; the fur is pale rufous all over, one and a half inch long, rather rough, and not close to the skin. The specimen was brought from the vicinity of Goree on the west coast of Africa.

The *Red Rheebock. (A. Fulvo Rufula.)* We consider this species as the adult of the former, notwithstanding the wide distance of the places from whence the two specimens have been produced. Allaman long ago noticed a species under the name of Rhoode Rheebock, or Red Roebuck, not Rietbock; and M. Afzelius justly viewed it as a species. Mr. Burchell in his arduous travels obtained a male, and M. Lalande a female of the species. If the Nagor be deemed to be the young, there is at least no doubt of the Lalandian being the female. We have drawn and compared both, and Mr. Daniell has likewise published a good figure of the male in his *Sketches of African Scenery*, &c.

The male in the British Museum is four feet eight inches long, two feet eight inches at the shoulder, and about the same at the croup. The head measures from the nose to the horns seven inches, and from the nose to the ears nine; the horns, placed behind the orbits, are six inches long, close together at base, a little compressed, black, not much divergent, suberect, bent forwards with five obscure semi-annuli, separated by striæ in the front, reaching near half way of their length, the points smooth and rather approximating; the ears are long, open, oval, edged at top with black, well lined with white hair both short and long. There is a small fold indicating a lachrymary sack, and the nostrils encompass a middle-sized black muzzle; the face, throat, back of the ears, neck, and anterior part of the legs are tawny or clear fulvous, with a little whitish on the brows; the chin is rather deep and strong, and with the lips, internal part of the arms, belly, anterior and internal face of the thighs, white; the shoulders, back, an-

terior part of the upper arm, the flanks passing obliquely upwards towards the hips, croup and thighs, are fulvous-brown, with a cast of dull purple; the tail is six inches long, but the hair is loose, and furnished like a brush, making it nearly nine inches, the base dark, the middle fulvous below, and the tip white; the legs are strong, tawny, and a dark streak marks the anterior face of those of the male. On the back, croup, and sides, the hair is long, hard, loose, not very abundant, but feathering in whirls diversely turned, but most from the croup forwards; the skin and hoofs are black, as are the mammæ of the female, which are four in number. This sex is lower and longer, without horns, but strongly made.

The Red Rheebock inhabits the rocky mountains of Caffraria in small families of six or eight, seldom appearing on the plain; it springs with great force and audacity among rocks, but is not very swift, running with galloping action somewhat like a horse.

The *Cream-coloured Antelope.* (*A. Isabellina*). We suspect this species to be the Voalebock of the colonists, and a mere variety of colour of the former; it was established by M. Afzelius from a specimen in the collection of Thunberg. It is four feet ten inches long, two feet six inches at the shoulder, and two feet eight inches at the croup. The head from the nose to the horns is ten inches; the ears six inches and a half; the horns are eleven inches long measured upon the curve; their circumference at the base five inches four lines; distant one inch six lines at base; their basal direction at first parallel with the forehead, bending slightly upwards by degrees; they are black, round, shining, obliquely annulated, rough at base, six or seven in front, eight or nine in rear, because some of the superior are incomplete. The lachrymary sinus indistinct, only marked by a naked triangular spot situated before and beneath the eye; the incisors very short, the intermediate

largest; the ears are long, straight, cylindrical at the base, dilated in the middle, almost pointed at the summit, white inside, and furnished with additional bristly hairs. A small space at their root covered with very fine hair; the tail shaped like a brush, and straight; the legs covered with close short hair; no brushes on the knees. There are inguinal pores, and the hoofs are narrow and pointed; brownish-black in colour. The hair is one inch and a half long, standing off the skin; the interior brown, the longer and exterior gray, their intermixture producing on the back and flanks a general cream coloured or pale dun tone. The belly and end of the tail are white; the forehead, top of the head, anterior face of the fore-legs and some other spots are yellowish; the hair is feathery in several places on the back and behind the head. The specimen was brought from the Cape of Good Hope. If we except the omission of an obvious muzzle, the apparent superior length of the horns and head, and their basal direction, scarce a difference remains between this and the last species, but what results from a different tone of colour, which, however, might resemble more if the denominations of teints were alike with every describer of colours. It may be asked here if the female of this species or variety can have been mistaken by M. Vaillant for a kind of wild Equus, which he designates as an Isabella Coloured Zebra. As the gallop of the preceding species is said to resemble the action of a horse, the mistake may have occurred when the animal was seen at a distance.

The *Riet Rheebock*. *(A. Villosa.)* This species, known at the Cape by the name of Riet Rheebock, or Reed Roebuck, and noticed by Lichtenstein under the name of *A. Capreolus*, forms the passage from this group towards the next. M. Desmarets describes the female, and we have long possessed drawings of both sexes from the collection of Mr. Burchell, in part, at the British Museum. In their

structure these animals assimilate most with the Reduncæ; for although the horns are nearly vertical on the head, the tips have a slight inclination forward; they have the muzzle of Fulvo Rufula, and the lachrymary sinus, though inwardly sufficiently large, is outwardly scarce visible; but the proportions of the animal have peculiarities not observable in other species; the neck is longer, the body less in circumference than any other Antelope, if we except the Chiru of Bootan; the hair also is soft, silky, and long, properties which it may derive from the scorched barren nature of the soil, which Providence has assigned it for a home.

The male is about four feet six inches long, two feet five inches at the shoulder, and two feet seven inches at the croup; the horns, placed above the eyes, are eight inches and a half long, straight, a little inclined forwards, nearly perpendicular to the plane of the face, black, round, slender, with thirteen rings reaching from the base half way up; distant at base one inch and a half, at the tips three inches and three-quarters; the head measures from the nose to the horns six inches and a half, and from the nose to the ears eight inches; the ears are six inches and a half long, open, pointed at the tips, white inside, with three dark striæ, and gray outside; there is a dark spot at the angle of the eye, beneath the orifice of the sinus; the eyes are large and black; the muzzle round, small, and black, terminating in a pointed nose; the lips and chin, white, with a black spot at the inferior angle of the mouth; the neck is long in proportion to the body, and the body very slender in girth; it is covered with rather long hair, feeling in texture like that of the Kanguroo, annulated gray and white, with a coat of yellowish, which becomes darker with age, on the specimens preserved in Museums, but is at first bluish ash colour; the breast and belly, and the inside of the arms and thighs, are white; the front of the legs are

brown, the posterior part ochery; the tail almost five inches long, is gray, tipt with white, but has no real tuft at the end; the legs are slender, rather long, and the hoofs small, pointed, and black; round the eyes there is a dark circle, enclosed within one of a whitish colour; the face is more mixed with ochre and brown, and the hair close and harder; the chaffron dark-brown, and the throat almost white.

The females are smaller, without horns, but provided with four mammæ and inguinal pores; but the texture of the hair, and distribution of the colours, is nearly the same as in the males. We have compared three of them, and one male. The species has similar manners as the former, living in pairs, or small families, the males suffering no adults of their sex in company. When they are observed in greater numbers, it is occasioned by the attraction of water, a rare element in South Africa, but most particularly in the barren districts of the west coast, where they mostly reside. The females bear but one kid at a time, which is at first almost fawn-coloured. It is an animal of great swiftness, moving with wonderful rapidity by lengthened stretches, close to the ground, so as to seem to glide over the desert like a mist driven by the winds, and, favoured by the indistinct colours of the fur, is immediately out of sight. The Bushmen, and western tribes make lance heads, awls, and other tools, of the horns, and. occasionally, cloaks of their skins for the women*.

* On this and many others of the Cape Animal, I owe much of my information to the late Colonel Graham, who, as Colonel of the Cape Corps, commander of the interior, and a keen and indefatigable sportsman, had collected numerous facts on the local natural history of the Colony, which it was his duty often to traverse in various directions, where he was settled, and fated to die, in the full vigour of life. I would fain say more of one whom I respected as a private gentleman, and admired as a soldier, in the tumultuous scenes of war.

The *Orebi.* *(A. Scoparia.)* The last which we place in this group is the Orebi, one of those anomalous species which retains a Reduncine character in the horns, and the four mammæ in the females, but departs from them by having the suborbital sinus developed, as in the next, and, besides, resumes a character belonging to true antelopes in the brushes on the knees. The adult male is about four feet in length from nose to tail, and is equal in stature to the Roebuck, or twenty-two and twenty-four inches in height. The head is five inches long from the nose to the horns, and eight inches from the nose to the ears; the horns are nearly vertical, slightly bent forwards, black, round, five inches long, with six or seven wrinkles at base, and then five annuli reaching half way up, the rest smooth and pointed; they stand close above the orbits, one inch and a half asunder at base, and three inches and a half at the tips; the head is round, with a prolonged snout; the chaffron rather convex, and the nose terminated by a small muzzle: under the inner canthus of the eye is a well defined lachrymary opening; the incisors are small, overlapping, the external edges being oblique and prolonged; the ears are long, rather pointed, white, and villous inside; the neck slender, and the knees tufted in both sexes: compared with the length of the animal, the legs are high; the face and back are tawny in some, and paler-fulvous in others, this colour extending over the back of the ears, shoulders, flanks, anterior and external side of the fore-legs, down the croup, thighs, and hind-legs; above the eye there is in most specimens an arched white streak, and that colour surrounds the mouth and nostrils, passes along the under jaw, the breast, belly, and inside of the thighs; on the throat and breast the white hair is long, soft, and pendent; the tail is short, hairy, and blackish; the skin is black and naked in the groin of the pale coloured specimens, and the mammæ, four in number, are likewise black, but

in the tawny or bright rufous it is white, and the teats are rose-coloured; the females are without horns, and in other respects resemble the males.

Of this species we have compared seven specimens, among which three were females, and one a young male, whose horns were still more erect than in the adult, the annuli very small, and the edge of the buttocks white. The Orebi resides in pairs or small families in the interior of Caffraria, and from the difference of colour in the hide and in the fur, we would infer that it frequents both the woody cover and the open plain.

The Oreotragine Group.

In this section which embraces at present but one species, the characters present a sudden passage from the surrounding racemi to the Caprine forms and manners; the horns are short, slender, vertical, and parallel, with very few annuli; the suborbital sinus is conspicuous, and marked with a dark spot, but the head is short, the superior edge of the orbits projecting; the body and legs, when compared with the size, exceedingly robust; the hair is of a singular structure, being hard, flat, spiral, flexible, and erect upon the skin, with the tips turned back, or reclining; the females are hornless, but in other respects resemble the male; they have inguinal pores, and two mammæ?; their *habitat* is confined to barren precipitous rocks.

The *Klipspringer. (A. Oreotragus.)* The form of this animal is very like that of the Ibex Kid, of about seven months old. The male is about three feet seven inches long, and twenty-one or twenty-two inches high at the shoulder and croup; the head is short, broad, and round, tapering rather suddenly to a small mouth, terminated by a diminutive muzzle, of a black colour, the dark part ascending in a point upon the ridge of the nose or chaffron; the incisors are equal, touching at the edges, and the mid-

dlemost close together; the ears are middle-sized, broad, and pointed, reaching as high as the horns; they are white within, and whitish ash-colour outside; the horns are about five inches long, distant, round, vertical, slightly bent forwards, obscurely wrinkled at the roots, and annulated below the inferior third, the rest smooth, pointed, and black; the eyes, covered by the arch of the orbits, are full, dark, hazle, and lively; they are edged with black, and beneath them is a suborbital opening, marked by a black spot; the body is round and compact, and the tail almost rudimentar; the legs nearly as robust as in the Goat, the joints broad, the arms long, the cannon bones or shanks short, the pastern joints high and rigid; the hoofs short, rounded, hard, and black; there are no brushes on the knees, and the spurious hoofs are close and flat; the hair, of equal length all over the neck, body, and thighs, is squill-like, dry, and spiral, standing off the skin, and forming a natural pad, to protect the body from bruises, the points alone lying flat. It is ashy at the root, brown in the middle, and yellow at the point, producing the singular effect of a lively olive-green; the legs below the joints are buff.

None of the species in this genus have so completely the lively gamboling manners of the young goat as the Klip-springer; none bound with greater force and precision from rock to rock, gathering their feet upon points or rugosities among the cliffs, apparently too small to admit of foothold. The least obliquity or ruggedness of surface suffices them to run up and hold their footing. The solidity of their pastures is such, that on the plain, at their highest speed, no other marks are perceptible of their track, than the points of the toes, all other ruminants in similar cases always imprinting the spurious hoofs also. With powers like these, a certain sense of security against carnivorous animals is created, which exposes them to be shot by sportsmen, while, as it were, deriding the vain

efforts of his dogs. They were formerly so abundant in the colony of the Cape, that their elastic hair was used to stuff saddles; but now they are become rare, excepting in the interior. The females resemble the males in every respect excepting in the absence of horns; they live in pairs among the most precipitous rocks of South Africa, where they are, nevertheless, eagerly sought on account of their venison which is considered among the best in the country.

We have compared two males and three females, several skulls and fragments of their spoils.

The Traguline Group.

Messrs Forster and Lichtenstein have considered the present racemus as consisting of varieties of colour only, the animals being all of the same species: it must be confessed that their characters and colours, passing from one into the other, afford grounds for the suspicion and would lead to a conclusion that difference of age and of residence are sufficient to account for the trivial distinctions observed between them. The Cape colonists, however, are of a different opinion, and Mr. Burchell appears to coincide with them principally, because—with the differences of colour observed among them—they vary in manners, habitat and stature. As this is a question which cannot be decided in the present state of our information, nor indeed of very great importance, we shall describe them as separate species by the names which they have received from the above learned zoologists and travellers.

The group consists of animals small in stature, high upon the legs in proportion to their length, slender in form, and like the preceding, destitute or nearly destitute of tail; the ears are longer than the horns, rather broad and not much pointed; the horns are short, distant, round, vertical, parallel, inclining slightly forwards or backwards, with

no, or only slight, indications of wrinkles at the base. The skin round the orbits black, having a suborbital sinus, and small black muzzle; the females without horns, with two mammæ and inguinal pores.

The *Steenbock. (A. Rupestris.)* Professor Lichtenstein appears not to have known the adult of either of the Steenbocks, and particularly the present, which is larger and more robust in structure than his Tragulus. It is nearly equal in size to *A. Scoparia*, three feet six inches long, about twenty inches high at the shoulder, and twenty-one or twenty-two inches at croup; the head is oval, with the snout pointed, and terminated by a small round and black muzzle, ascending in a point on the ridge of the nose; the horns are vertical, or at a right angle with the plane of the face, distant, straight, parallel, round, pointed, and black, with only one or two rudiments of wrinkles at base, not quite four inches long, and seated nearly between the orbits; the ears longer than the horns, are open, pointed, with three dark naked striæ between, scanty white hairs within, and pale fawn-coloured outside, edged with black; the eyes are placed high in the head, with black eye-lashes, and a small black suborbital sinus placed beneath their inner canthus; the forehead and nose are pale chocolate rufous; sides of the face, mouth, and chin, fawn-coloured; the back of the neck, shoulders, back, and croup, rufous chocolate, passing into rufous on the sides of the neck, flanks, and thighs; the breast, belly, anterior part of the thighs, buttocks, and inside of the limbs, are white; the legs entirely dun, or dark buff; the groin is naked and black; there is a small collosity on the knees, and the tail does not protrude beyond the hair; the hoofs are rather high, short, and black, and the pasterns short. In this species the incisors are narrow, long, oblique, overlapping, and the two middlemost close.

The Steenbock is still found within the limits of the

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Sir William Smith, Esq.r del.t
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VLACKTE STEENBOCK.

A. RUFESCENS.

Published by G.B. Whittaker, Dec.r 1826.

Colony of the Cape of Good Hope, but is very rare, residing entirely among the rocky cliffs of the eastern districts, and evincing great vigilance and activity. The specimens we have seen came from Algoa Bay. In the Dutch language the name Steenbock properly signifies the Ibex, and can have been bestowed upon the species only on account of a similarity of manners between the two animals.

The *Vlackte Steenbock. (A. Rufescens.)* We are indebted to Mr. Burchell for a knowledge of the male of this species, which might be considered as the young of the former, but that its residence is on the plains, as the colonial name *Vlackte*, plain or open country, implies; and that the brilliant colouring of the fur is not a sign of nonage. The horns are subvertical, reclining a little at base, with the tips slightly bent, so as to point upwards; they are round, black, parallel, sharp, perfectly smooth, or without any wrinkles or striæ, three inches and a half long, one inch and a half asunder at base, two inches at the tips: the ears are longer than in the preceding, measuring four inches and a half, and reaching beyond the points of the horns, rather rounded at the tips, lined on the edges and inside with white hair, streaked with dark lines inside, and gray outside; the head is somewhat squarer, tapering gradually to the nose, and not as in the former contracting suddenly before the orbits: between the nostrils there is a small black muzzle; the head, neck, back, flanks, upper arms, and thighs, are bright fulvous-red; with something of a cast of crimson; a spot along the lower eyelids, and passing beneath the lachrymary sinus, is white, as is also the under jaw, throat, breast, internal face of the fore-legs, belly, interior of the thighs to the edge of the buttocks, and after part of the hind-legs and pasterns; the rest of the legs from the joint downwards are pale rufous: no tail is visible beyond the hair of the buttocks.

Of this species we saw the drawing of a female taken at

the Cape by the accurate Le Sueur, and found the male in Mr. Burchell's magnificent donation to the British Museum. The animal stands high on the legs for its length, which is only two feet six inches from the nose to the rudiment of tail. Of all the smaller antelopes, this appears the most elegant in the delicacy of its limbs, and brilliancy of colour. The Vlackte Steenbock resides in pairs on the open plains, along the borders, and beyond the limits of the Cape Colony, and is very rare.

The *Grysbock. (A. Grisea.)* This species was first noticed by Mr. Forster, and figured in the Banksian collection. It is larger than the last, being nearly three feet long, nineteen inches at the shoulder, and about twenty at the croup; the head is oval, and shorter than the former, four inches and a half from the nose to the horns, and six inches from the nose to the ears; the horns are nearly four inches long, round, black, smooth, vertical, sharp, slightly inclining forwards, one inch and a quarter asunder at base, three inches at the tips; the muzzle is small and black; a space round the eyes, and the prolongation of the inner canthus forming the lachrymary slit, are black; the ears, four inches and a quarter long, are wide and open, marked on the inside with three dark streaks, and rufous on the outside; round the nose there is a little whitish; the rest of the head, neck, body, and thighs, is deep chestnut-red, intermixed or stippled with single white hairs; the throat, breast, belly, and inside of the limbs and legs, are rufous; the tail protrudes little beyond the hair; the hoofs are small, black, and pointed; the pasterns short, and the cannon bones, or shanks, long and slender.

The Grysbock was described by Professor Lichtenstein under the name of *A. Melanotis.* It inhabits the mountains overgrown with shrubs, and is swift and vigilant. At present few remain within the limits of the Cape Colony. We have compared four specimens, two male and two

female, who, excepting that the latter is deprived of horns, are perfectly alike. Its local name of Grysbock signifies Gray Goat.

The *Bleekbock.* *(A. Palida.)* Among the Cape Colonists mention is often made of the Bleekbock, or Pale Goat, but the animal is rare. Professor Lichtenstein considered it as a mere variety, but it does not appear that a specimen actually came under his eyes, because he insinuates that it is the female, whereas the female is without horns; nor is it less in size, we having compared three specimens, all higher on the legs than the Klipspringer. It is about equal in stature to the Steenbock, but much more slender, and delicately formed: the head is rather square about the forehead, the horns perfectly straight, incline slightly backwards; they are round, black, smooth, and very pointed, with an obscure line running down the front; the muzzle is small and black, passing in a point upon the nose; the eyes, with a very small lachrymary opening, have a black edge round them; the ears are somewhat shorter and broader than the former, more villous within, and marked with two dark perpendicular streaks on their inner surface, and grayish on the outside; the forehead, neck, back, shoulders, posterior part of the upper arm, flanks, thighs, and buttocks, are of a pale rufous fawn colour; the lips, chin, and arch over the eyes, a spot on the throat, the breast, anterior part of the arm, belly, anterior and internal face of the thighs, white; the legs from the joints downwards pale buff; the tail, near three inches long, is buff; the pasterns are long; the hoofs very low, small, and black; the groin is naked, and the skin black; the females are somewhat more red in colour, without horns, but in other respects the same, shewing two black mammæ.

The Bleekbock inhabits the plains, is solitary, or only accompanied by one female; they conceal themselves in the bushes, are excessively shy and swift, and owing to the in-

distinct colour of their fur, easily escape the eyes of sportsmen: they seem to be confined to the eastern side of South Africa, and are nowhere numerous.

The Raphicerine Group.

This group might be united with the former, if the characters of the horns were alone to be considered, for they are destitute of every vestige of wrinkles or striæ, perfectly round, smooth, and very sharp, but not parallel. Their position on the frontals is subvertical, the forehead is very narrow, indicating animals of a diminutive size, whose residence, besides, being confined to the East Indies or the islands of the Indian Archipelago, makes it probable that when we shall be acquainted with the whole of their characters, distinctions will be observed which will confirm their separation. At present the horns attached to a part of the frontals is all that is known of them; but these tend to shew that Mr. Johnson alludes to them under the name of Small *Deer* in his *Sketches of Field Sports*, &c.; assigning them a residence in the Rhamghur district, "Where the *Deer* with four horns, or Chickara, are likewise found," and describing them as not larger than an English hare, with long ears, exceedingly active, and delicately formed.

The *Sharp-horned Antelope. (A. Acuticornis.)* M. de Blainville first described the horns of this species from the fragment of a skull in the Royal College of Surgeons of London; they are only three inches long, perfectly round, smooth, black, and pointed, about three-eighths of an inch in diameter at base, slightly bent outwards, and diverging; the frontal crest, passing behind them, unites with a broad parietal bone, with the sinciput much elevated, narrow, and somewhat square; on the parietal are many rugosities, perhaps from disease. The fragment belonged to a young animal, and was brought from India; and upon comparison with the Chickara of the next group, we have some doubt

whether the Acuticornis be not the same species, with the spurious horns and anterior part of the frontals wanting, but this, nevertheless, much smaller.

The *Awl-horned Antelope. (A. Subulata.)* The horns of this unquestionable species, attached to the frontals, are likewise in the Royal College of Surgeons; they are not above three-eighths of an inch in diameter, subvertical, round, smooth, black, four inches and a half long, bending outwards in the middle, and the points again a little inwards; one inch and two lines asunder at base, two inches distant about the middle, and something less at the points; they stand higher on the frontals than the preceding, the sinciput is broader, round, and placed on a narrower parietal. The specimen was likewise brought from the East.

The Tetracerine Group.

There are few or no examples of animals in a state of nature, beside the present, who have four horns as a permanent character. The Colus, indeed, is reported to be found sometimes with three, and several breeds of sheep have four, five, or six horns, but these are invariably monstrous productions, issuing from nearly the same base, and constituting a morbid superabundance of that organic substance. In the Tetraceri, however, these productions are constant and uniform, the upper or true pair rising on the frontal crest, and the lower, or spurious, as invariably between the orbits. Skulls of these animals have been preserved for years in the Museum of the Royal College of Surgeons, and in the superb collection of Mr. Brooks. From the former M. de Blainville published an account of a species; but we are indebted to the investigations of General Hardwicke for a complete description of the animal. For although M. F. Cuvier produced a figure, his notice communicated by the late M. Duvaucel, is not sufficiently

explicit, and possibly not altogether correct. We are, however, inclined to believe that there are two species of Tetraceri, differing in the characters of the horns, and in some other trifling particulars, as shall be noticed in the sequel. The name of the group is derived from the generic denomination which Dr. Leach first bestowed upon the Four-horned Antelopes.

The *Chickara. (A. Chickara.)* We cannot give a more satisfactory description of this animal than by repeating the excellent account furnished by General Hardwicke, in the *Linnæan Transactions*, Vol. xiv. "This species of Antelope," he says, "seems hitherto to have escaped any particular description of the naturalist; and this circumstance is the more remarkable, as the animal is not scarce in India. It inhabits the forests and hilly tracts along the western provinces of Bengal, Bahar, and Orissa, and is known by the name of Chickara. It is an extremely wild and agile creature, and only to be tamed when taken young. In size this species is something less than the Harnessed Antelope *(A. Scripta)*; it is in height, from the foot to the top of the shoulder, twenty inches and a half; and in length, from the nose to the root of the tail, thirty-three inches, or two feet nine inches; and the tail is five inches more. The superior, or common horns, are black, subulate, rounded, without annulations, smooth, and erect, slightly inclined forward, and a little diverging; their length three inches; space between them at the base one inch eight-tenths; the greatest thickness at the base is two inches in circumference, and gradually tapering to a point one-tenth of an inch in diameter. In front of the common horns (one inch four-tenths), in the middle of the forehead, and between the eyes, rises a very short pair of spurious horns, erect, stumpy, smooth, cylindrical, three-quarters of an inch in length, one inch and a half in circumference at base, and suddenly tapering to a point; they are apart at

base three-quarters of an inch, and at their tips one inch two-tenths. Head in length seven inches and a half, and its greatest circumference across the cheeks and behind the spurious horns thirteen inches; ears mostly erect, ovate; the greatest breadth about two inches and a quarter, and length four inches and three-quarters; nose naked and black; the margin of the lips black; eyes large, with strong bristly black eyelashes; limbs delicately made, the shanks of the fore-legs being two inches and a half in circumference, and those of the hind three inches; the proper and spurious hoofs are black; the greatest circumference of the body is twenty-nine inches. The general colour of the animal is an uniform and bright bay on all the upper parts, and below, *i. e.*, the chin, the under line of the neck, the abdomen, the inner side of the thighs, and under the tail, inclining to white, more or less mixed with sandy hairs; the teeth in the lower jaw are eight in front, the two middle ones being much larger than the six lateral teeth, and spread out; their inner margins rounded and not touching, and their internal surface hollowed out like a spoon; in the hinder part of the jaw, on each side, are six grinders, with pointed surfaces, and a like number in the upper jaw, similarly constructed.

"The female differs only in having no horns, and being of lighter colour. This distinction of colours is found to be a permanent character; it at least remained so for the four years I kept a pair in my possession, and within which period they bred; two young ones were produced at the same birth, one male, and the other female; and the distinction of colour, as above, was conspicuous at that early stage, and continued. The male in the rutting season becomes exceedingly wild and mischievous, and, although partly domesticated, continues dangerously so, running at every animal within its reach, whether deer, goat, or man; even the feeder could only approach him on the verge of the

circle to which the rope he was tied with allowed him to reach."

In this statement the General has not marked the time of gestation, nor the period of the rutting season; and we regret the omission of the number of mammæ in the female, as they are at least a secondary character for the distinction of groups.

The *Four-horned Antelope. (A. Quadricornis.)* It is a question whether the skull in the Royal College of Surgeons be of the Chickara or not: the length, position of the upper horns, and their direction, are similar, but the spurious horns are subtrigonal, and of a yellowish colour on their internal face, possessed of three wrinkles or small annuli at the anterior base, robust, vertical, and one inch and two-thirds long. The head is narrower than the former; the frontals are prolonged above one inch before them, having on each side a wide open space, and the nasal bones begin consequently lower down. In front of the spurious horns are several rugosities; the parietal is broad, and surmounted by an elevated crest of the sinciput; the superior arch of the orbits is also more straight than usual, and more prolonged over the eyes. In this specimen the osseous cores of the superior horns alone remain two inches and three-quarters long, but no comparison can be made of the horny sheaths themselves; the skull is something above seven inches in length *. There is a second skull in the Museum of Mr. Brooks, from which, we believe, Dr. Leach drew the characters of his *Tetracerus Striaticornis*. It is, perhaps, worth remarking, that in this racemus the interorbital horns appear to be composed in the greater part of corneous matter, with only a short bony nucleus within.

* M. de Blainville, mistaking the meaning of the ticket attached to the head, says, it is named Hoornadabad in India, whereas the specimen is stated to have been brought from Moorshadabad.

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H. Kingsley sc.

THE FOUR-HORNED ANTELOPE.

A QUADRICORNIS ?

Published by G.B. Whittaker Dec.^r 1820

In the paper before noticed, General Hardwicke expresses a doubt that the head here described is not of the same species with the Chickara, and we are inclined to the same opinion, especially since the drawing of a four-horned antelope was published by M. F. Cuvier, communicated to him by the late M. Duvaucel, who, it appears, represents the species as belonging to Nepaul. In this figure, of which we were enabled to make a copy through the kindness of M. Cuvier, the superior horns are slightly annulated, whereas in the Chickara they are perfectly smooth; the animal is also more elevated on the legs, and the colour of the back is brownish; the ears are larger, with three faint streaks within them; the spurious horns stand before the middle of the line between the orbits, and not behind that line, as in the Chickara, and the suborbital sinus terminates in a round opening, and not in a slit like the other; the under jaw is white, and the tail longer. It may, therefore, be presumed, that the Duvaucelian figure represents the Quadricornis, in which the more advanced position of the spurious horns is very evident; nor can we assent to the conclusions in the note at the end of General Hardwicke's communication to the Linnæan Society, that the figure in question is copied from his specimen, because we have been allowed by M. F. Cuvier to copy several other drawings of ruminants, forwarded by that gentleman from India, some of which will be noticed in the sequel, including specimens from Nepaul. We think these observations due to the memory of M. Duvaucel, whose zeal in pursuit of natural history has led to a premature death*.

* Dr. Leach has favoured us with a note respecting his *Tetracerus Striaticornis*, in which he expressly states, "Horns longitudinally striated, transversely striolated, with rings at their bases." This character appears to agree with M. Duvaucel's Chickara, or our Quadricornis, and supplies the characters deficient in the skull above noticed.

The Cephalophine Group.

We place, among others, in this group, the animals which have been noticed by authors under the name of Grimmea, varying very considerably in stature, but all distinguishable by a tuft of hair rising from the forehead, and more or less spread between the horns; by a pouch or sack opening between the orbits and the nostrils, in some forming a black slit in the shape of a segment of a circle ending near the nostrils, in others by a puncture near the corner of the mouth, and seemingly appropriated to a different purpose in the animal economy, than the usual lachrymary sinus. The horns of all are small, straight, or nearly so, reclining, placed high on the forehead, black, with wrinkles or annuli; the muzzle is rather developed and black, and several have the forehead entirely covered with long fulvous hair, parting to the right and left from the centre. With the exception of one, they want no brushes, the pasterns are short, and mostly of a dark colour, passing in a streak upwards to beyond the knees; the tail is short and tufted with long black hairs; the females are without horns, and have two or four mammæ. The group extends over South Africa, from Senegal to the Cape of Good Hope. It is probable that the whole is possessed of nearly similar manners; residing in bushes and low covers, standing up on the hind-legs to look out for danger, even leaping into the air to overlook obstructing vegetation, and then running into concealment from one bush to another. These manners, and the strong family resemblance maintained through them all, account for the difference of stature assigned to species under the same name, and the vain endeavours to make them agree.

The *Bush Antelope.* (*A. Silvicultrix* *.) This species is

* Silvicultrix appears to be a wrong translation of Bush Goat. The Swedish Zoologist has no doubt mistaken the meaning of *bush*, and considered it synonymous with *forest*; Desmarets justly applies the term Buisson.

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From a specimen at Exeter Change 1826

W. Mulready

BUSH ANTELOPE.

A. SILVICULTRIX. Young Male ?

known to the British residents at Sierra Leone by the name of Bush Goat; it is of considerable stature, and if really belonging to the present group, the largest of the whole. The length from nose to tail is five feet; height at the shoulders less than three, and at the croup three feet two inches; the head is ten inches long, and both the horns and ears four, and the tail six; the head, as in others of the group, is oval, the snout pointed; the horns, reclined on the prolongation of the plane of the face, are short, very straight, pointed, closely wrinkled for about six lines, then marked with inequalities for the space of an inch more; the points diverge outwards; the ears, situate near the root of the horns, are about the same length, rounded at tip, and the eyes are furnished with heavy eyelashes; the tail hanging and bush-like; the anus naked; the legs are slender without tufts; the mammæ two; the fur generally soft, recumbent and shining, principally of a dark brown colour, paler on the neck and flanks, grayish on the thighs and buttocks, almost yellow on the throat, and Isabella colour along the spine, widening over the loins, where the hair lengthens to two inches; hair of the head short and close; anterior part of the cheeks, sides of the nose and chin, of a dirty yellowish-white; chaffron and forehead of a clear brown, surmounted by a tuft of hairs one inch and a half long, covering the root of the horns; the external side of the ears brown, the internal grayish; the tail dark; the legs chestnut brown.

This species inhabits the bushy acclivities of the open mountains of Sierra Leone, and the vicinity of the Upper Quia and Pongas rivers. It quits the cover about sun-rise to feed, and is then shot by sportsmen. It is not so fleet as other Antelopes, and its venison is esteemed. From the above account, extracted from the *Acta Upsal.* by M. Afzelius, this animal is nearly allied to the next, perhaps they form only varieties of the same species.

The *Broad-eared Antelope.* (*A. Platous**.) There exist in the Museum of the Missionary Society of London, the spoils of an antelope belonging to this group, brought from the Cape, under the wrong name of Steenbock. The specimen is enclosed in a case, and in a recumbent attitude, and when the sketch and notes were taken, it was placed in an unfavourable light; some inaccuracy may, therefore, exist in the description. It is estimated to be in length equal to the preceding, with a very pointed snout and diminutive muzzle. The horns are sub-erect, not five inches long, black, straight, divergent, round, and very sharp at the tips, somewhat irregularly annulated to three-fourths of their length; the ears are very wide, pointed, longer than the horns, whitish within, and dun-coloured on the outside; the eyes are large, edged with black eyelashes, and beneath them, more on the cheek than usual, is a black spot, marking the suborbital opening. From the vicinity of the nostrils the chaffron is dark sepia, spreading wider at the commencement of the forehead, from whence the hair is more lengthened and bristly, of a bright brown, and turned upwards, so as to cover the base of the horns. Round the nose and mouth, the fur is close and fine, of a yellowish white and fawn colour on the cheeks, round the eyes and temples. The back of the neck is brown, becoming paler as it approaches the throat, by a mixture of fawn colour, and the throat itself is almost white; the shoulders and back are of the same mixture of brown, fulvous, and fawn colours, but we observed no lengthened hair on the croup, as in the former; the belly and inside of the limbs are gray; the legs fine and firm, yellowish-brown in colour, without tufts, and the hoofs small, pointed, and black; the tail is of the colour of the back, not bushy, and appears full six inches long, but without a terminal tuft. The spe-

* Πλὰτυς, *latus*, ὦυς, *auris*.

FOUR-TUFTED ANTELOPE.

A. QUADRISCOPA. Ham. Smith.

cimen seemed long in the body, and the fore-legs may be some inches lower than the hind, of which the shanks are evidently long.

By the denomination of Steenbock, though it be applied to the wrong species, we may infer that the animal resides on rocky mountains in the interior of Caffraria, but its habits are unknown. If it be the same as Silvicultrix, the species must extend from Senegal to the banks of the Gareep. The figure was designated, in the original series of drawings in our possession, by the name of Platous, before the description of Silvicultrix was published, and we have thence preferred retaining them separately, because there appear no proofs that the species of the Cape Colonies and Nigritia are the same, excepting when they both reside on the east coast of Africa, and our specimen was understood to have come from the vicinity of the Gareep. There is, besides, a doubt that Silvicultrix is described from a female, in which case that species cannct belong to the present group, but must be referred to another not at present determinable.

Four-tufted Antelope. (*A. Quadriscopa.*) We saw this singular and hitherto undescribed species in a living state at Exeter 'Change, where it was kept for some time and then sold, but being excessively shy, we understood that it met with an accident in removing, and probably perished. Thus much it is necessary to premise, in order to explain why a more accurate description could not be obtained. It was less elevated on the legs than a roebuck, but about equally long in the body; the head round with a tapering nose and muzzle; the horns about four inches long, situate rather high on the head, nearly straight, divergent, slightly bent back, round, black, sharp at the tips, with about six or seven small annuli at base; the ears rather wide, longer than the horns, marked with two black striæ within; the neck long, the body rather bulky, and the legs very elegant;

the forehead was covered with longish hair of a mixed buff and sepia-gray, darker down the nose; the back of the ears similarly coloured; from their root, passing round the eyes to the mouth, the colour was buff. A small lachrymary opening appeared under the eye, and between that and the nose a narrow dark streak, apparently not open but naked. The cheeks, neck, back, flanks, and thighs, were of a similar buff and sepia-gray, paler on the flank, and towards the belly and buttock edged with an indistinct darker band; the lips, breast, belly, inside of the limbs, buttocks, and houghs, were white; the external and anterior face of the arms and hind-legs dirty buff, marked above the knees with four narrow and dark cross streaks, similar to those usually seen on the legs of mules; but the most remarkable character was, that brushes or tufts of hair of a dark colour marked each leg below the knees of the anterior, and on the upper anterior face of the posterior; the pasterns were short, and the hoofs small, black, and pointed. The individual was brought from Senegal.

Burchell's Antelope. (*A. Burchellii.*) In the Cephalophine group, the Duiker or Dodging Antelope appears to form not a species alone, but a small racemulus, being surrounded by others so nearly allied, that they may be regarded as varieties, although we believe it most advisable to describe them separately, leaving the question of identity to future investigation. At the head of these, appears a specimen shot by Mr. Burchell's hunters, who, as we were informed, considered it as new to them, nor did a second come under his observation. The spoils of the animal are now in the British Museum, and although the characters in general would refer them to a *A. Mergens*, yet when compared with several specimens of that species, procured by the same indefatigable naturalist, the differences are sufficiently obvious. The total length, from the nose to the rump, is three feet five inches; from the nose to the horns

seven inches; length of the horns, five inches; of the ears, six inches; total length of the fore-leg, one foot three inches; length of the posterior cannon bone, or from the toe to the hough, one foot. The structure of the animal, and particularly of the limbs, is remarkably solid; the horns placed high on the head, little elevated from the plane of the nose, much approximated, parallel, the superior third alone slightly bent outward, and then again inward and forward; they are black, round, and obtuse at the point, shew at base a succession of six or seven very irregular coarse wrinkles, then a striated space, surmounted by a second series of irregular wrinkles, striæ and obsolete annuli, not easily described with clearness. There is no external opening of a lachrymary sinus, and the suborbital pouch is scarce perceptible; the ears are wide, long, and open, marked with three grayish streaks within; round the base of the horns, the hair is long, lying outwards, and upon them of a bright fulvous colour; the forehead is dun, and the chaffron black down to the muzzle, which is small and round; round the eyes, cheeks, sides of the nose, and back of the ears, the colour is reddish-buff gray; the neck, back, flanks, croup and buttocks, are covered with rather coarse loose hair of a brownish rusty dun colour, producing a dark Isabella teint; the throat, belly, and inside of the limbs, more ashy; the tail is short, twisted, lined with coarse hair, above black, beneath white; the legs dark buff, with a blackish streak down their front, from the shoulder to the fetlock, from whence it spreads, and renders the pastern wholely black; the hind-legs have a similar line along the shanks, and upon the anterior part of the pasterns; these are very short and strong, and the hoofs rather high pointed and black.

We propose to distinguish, provisionally, this species by the name of the traveller, to whose arduous enterprise we are indebted for this and many other subjects of the

ruminating order. It was, we believe, obtained in the interior of the west side of Caffraria.

The *Duiker Bock.* (*A. Mergens.*) There is a particular distinguishing character about the horns of this species, which separate it unequivocally from all other Antelopes. It consists in a ridge more or less obsolete, rising on the anterior surface, and passing through the four or five annuli of the middle, but not through the closer wrinkles at the base. The horns do not exceed four inches in length, somewhat more distant at their root than in the preceding, diverging slightly, bending outwards and more reclining along the plane of the face, black, and obtusely pointed; the total length of the animal is from three feet two inches to three feet six inches, and the height about twenty-one inches at the shoulder, and twenty-three on the croup, or something more; the forehead is entirely covered with long coarse hair, reaching above the base of the horns, of a fulvous colour, which passes also over the back of the ears: these are five inches long with three dark streaks on their inner surface; the chaffron has the same black streak down to the muzzle, and the legs similar dark markings, and somewhat the same robust structure as the former, but on the side of the nose a dark naked slit is very perceptible; the fur is of a light brown colour, close and smooth, and the throat, breast, belly, inside of the limbs, and under part of the tail, are partially white. In the female the white extends along the back of the legs, and the dark colours on the front are wanting. Among the different specimens examined, the fulvous hair of the forehead was sometimes tarnished, and the annuli of the horns scarce perceptible, but the basal wrinkles and the anterior ridge always prominent. The frontal ornament is then often in the shape of a single tuft placed between the ears, especially in the females, and the whitish parts ashy. These may be signs of youth, for in an old male the colour of the

C. Jaunsol pinx.

R. Havenley sc.

ANTILOPE EURYCERA.

From the Life
Published

fur resembled the Burchellian, but the characters of the horns were decidedly of the present species.

This species is easily tamed to a certain degree, but always timid, becoming alarmed at the least unusual noise, and concealing itself on hearing thunder. It resides in bushy plains, alone, or in pairs, rising upon the hind-legs to look round, making a blowing noise with the nostrils, and then stooping and flying under the cover of the vegetation to stand and rise up again: we have compared eleven specimens.

Dodger Antelope. (*A. Ptoox.*) The name of Duiker in the Dutch language, is derived from *Duiken*, to dodge, to stoop, not to dive; it has been applied at the Cape to the former animal, and transferred by zoologists to the present, and even to the next or the true Grimm. The species or perhaps variety of the Duiker now under consideration, is here designated by the English name, for an instinctive qualification in its manners, which in this particular resemble the true Duiker, and the specific name is that which Professor Lichtenstein has pointed out for this or the former species. There is so much similarity in the general aspect of the two species as to be easily confounded. The distinctions, however, appear to be, that the present is somewhat less in stature, or the size of a kid, more delicately framed, destitute of the prominent muzzle, the nostrils being almost ovine, and the horns scarce three inches long, bending outwards, with only three annuli, black, round, pointed, and without ridge in front; between them there is a small black brush of hairs standing up like a feather; the orbits are rather prominent; the lachrymary sinus a little prolonged, and shewing, midway between the eye and mouth, the small perforation of the lower pouch; the face and forehead is of a rusty dun colour; the sides of the head and external face of the ears, fawn; a little white about the lips, throat, breast, lower abdomen,

and inside of the limbs; the ears are not four inches long, and whitish inside; the general colour of the neck and back is pale dun; a black streak passes from below the knees, covering the anterior part of the pastern, and a similar spot marks the posterior pastern; the tail is short, dun at base and black at the end. We have compared two specimens, both males, one from the Cape, the other from Western Africa.

Although there are marked distinctions between the three above-described species, and there is no direct evidence to shew that they arise from difference of age, of which Burchell's would be the old, and the present the young, yet it was thought preferable to place them under different names, particularly as the Ptoox, is both more daring and agile, and said to have a different voice.

The *Grimm.* (*A. Grimmia.*) This species is now distinctly known by the description of M. F. Cuvier, from the living animal: it is lower than the above, more clumsily built, but equally active and vigorous. The head is rather heavy, terminated by a prominent muzzle; the horns very short, stout, reclining, and almost concealed by the profusion of black hair covering the forehead, and rising between the horns to a point: this colour descends the whole length of the face; the ears are short and wide, white on the inside and pale gray on the outside; below the eye there is a lengthened slit, observed in several of the former, containing an unctuous substance, but no lachrymary sinus; the region about the eyes, cheeks, and side of the nose is fulvous-fawn colour, passing in a lower tint down the neck, shoulders, and flanks; the under jaw is white, and the lips and chin dark ash colour; from the withers to the tail, a broad bluish ash coloured streak covers the back and croup, mixing with the fawn coloured flanks, by an intermediate space of fulvous, which passes also along the buttocks and thighs; the tail is longer than

in the former, black, with a little fawn at the sides; the posterior legs and internal face of the thighs are blackish ash colour, the anterior of the same tone having only a small streak at the back of the arm paler; the female is more coarsely fawn, and ashy gray on the back and sides, but the black streak down the face is very conspicuous, ending in a broad pointed tuft above the forehead.

The male measures, from nose to tail, about twenty-seven inches in length; the head six; the stature at the shoulder seventeen, and at the croup eighteen inches; the pair were brought from Senegal, and were excessively active and timid. There is a skin of a fawn, probably of this species, in the British Museum, brought from Sierra Leone. It is eighteen inches long, the horns just pointing above the hair, seated far back, about half an inch in length; the head is oval, with small muzzle, and a slit on each side of the nose; the ears rounded at tip, mouse colour: general colour, dark brown and red gray.

Maxwell's Antelope. (*A. Maxwellii.*) A specimen somewhat inferior in size was brought home from Sierra Leone by Colonel Charles Maxwell. It was an adult female, which produced a kid while in captivity. Comparing this animal with the female Grimm, the differences are that its size is somewhat inferior and more elegant; the head, seen in front, is squarer above the orbits; the ears are longer and more pointed; the muzzle is equally full and round, but beneath the eye there is a blackish spot, and low down on the cheek a puncture opening the pouch, corresponding nearly with the upper maxillary perforation; the forehead and nose are dark coloured, with a streak on each side above the eyes, resembling brows; between these and the eyes, the cheeks and sides of the face, the colour is pale dun; the neck, back, and croup, dark brownish-dun, lighter on the flanks; the inside of the ears, breast, internal face of the legs, and anterior part of the thighs and

belly, white; the mammæ, four in number and pale yellow, form a small udder; the tail is two inches long, and black; the hoofs small, very pointed and black: the specimen lived two years in England. No decisive opinion can well be formed respecting the locality of the animal in a systematic view, while the male remains unknown, but it appears to form the passage from the present group to the next. We suspect this to be the Philantomba of the Sierra Leone Negroes; not uncommon there and yet not clearly described*.

The *Slate-coloured Antelope.* (*A. Cærula.*) This species is known among the Dutch colonists at the Cape, by the name of Blauwbockje, and Kleene Blauwbock, or Little Blue Goat. The male, among the donations of Mr. Burchell to the British Museum, measures about twenty-eight inches from nose to tail, nearly thirteen inches at the shoulder, and fourteen at the croup: the head is rather long and pointed, with a small muzzle; no lachrymary opening is perceptible, but lower down towards the nose there appears an indication of a lower pouch; the horns are one inch and a half long, recumbent, with the tips turned upwards; they are round, black, and pointed, having five semi-annuli in front, partly concealed by the hair; the ears are rather short, open, and round, white on the inside; the back part, a space round the eyes and the legs, are buff; the face, cheeks, neck, body, and thighs, a slaty purplish-blue with a cast of brown, which predominates as the specimens continue to be exposed in a stuffed state; the lips, chin, a spot on the throat, the breast, belly, inside of the limbs, and anterior part of the thighs, white; the shanks, or cannon bones of the fore-legs, are seven inches

* Since writing the above, a gentleman, long resident about Sierra Leone, informs us, that the Philantomba is the animal noticed as a kid in the preceding article, in which case it is nearly allied to the Kleenebock, or *A. Perpusilla.*

long; the posterior to the houghs six inches; the pasterns only half an inch; the hoofs oval, three-quarters of an inch long, and horn colour; the spurious hoofs very small but distinct. A female in the Museum of Paris is smaller and lower, the blue colours more distinct, but less white about the belly or limbs.

There are good figures of this species in Mr. Daniell's *Sketches of Southern Africa;* its Dutch name Blauwbokje has caused it sometimes to be confounded with *A. Leucophæa*. The species resides in woods and bushy plains on the borders of the Cape Colony; it is fleet and cunning, and was formerly more common near Cape Town.

The *Kleenebock*. (*A. Perpusilla.*) This species is somewhat less, or about twenty-six inches from the nose to the tail; the head is shorter, more suddenly pointed to the muzzle; the form more graceful, but the make of the ears and the appearance of a suborbital sack as in the former; the colours in general are dull brownish-buff on the face and back, the limbs paler buff, and the throat, belly, and interior side of the thighs, white; the hair on the forehead is somewhat longer than on the face; the horns are black, conical, horizontally reclined, slender, and the points slightly turned inwards, and nearly two inches long; no lachrymary opening, but the lower slit visible. In the mouth the intermediate incisors are broad and in contact; the pasterns are rather long; the hoofs and the spurious hoofs very small. This species inhabits the under-wood and open forests of the interior of Caffraria, where it is known to the Hottentots by the name of Noumetje, and to the colonists by that of the Kleenebock: we consider it as perhaps a variety of the *Cærula*, but of a different species from the next.

The Neotragine Group *.

In this section are included the smallest species of the

* Νεος, *juvenis*, τραγος, *hircus*.

genus. They are distinguished by an oval head, with a pointed snout, terminating in a diminutive muzzle; the horns are very small, lying horizontally on the top of the head, with a few annuli or semi-annuli to the front, and the base not concealed by the hair of the forehead, though somewhat lengthened, and retaining the Cephalophine character; the ears of all are short and round; the lachrymary opening is not as yet sufficiently investigated, but appears to be wanting in one species; there are no brushes on the knees, and the tail is short; the females are deprived of horns, and have two teats? These very delicate creatures are confined to Central and Southern Africa, living in solitude in the forests: their voice is said to be a loud and shrill warbling kind of cry.

The *Guevei.* *(A. Pygmea.)* It is the female of this species which has been so often confounded with, or caused the establishment of, the Pigmy Musk, a species altogether very doubtful! yet in this species there are two varieties, if not actually different animals. The larger Guevei, or Royal Antelope of Pennant, is about eleven inches high at the shoulder, and near twenty inches in length from the nose to the tail; the horns are one inch and a quarter long, placed high on the head, rather close, bulky at base, black, with one or two prominent annuli, then taper suddenly to a sharp point; there is a small lachrymary opening before the eye, no appearance of a sack beneath it; the muzzle is complete, round, and black; the ears are short, round, and lined with white hair within, and the outside, face, cheeks, upper lips, neck, back, thighs, and legs, are bright bay, more buff on the limbs; the under jaw, chin, throat, anterior part and inside of the thighs, white; the breast and belly grayish-white, mixed with yellow; the tail is short, hairy, bay above, and white beneath; the legs are very slender, the pasterns rather long, and the hoofs black; the spurious hoofs appear wanting in some specimens.

The females are smaller, hornless, and more dull in colour.

The Guevei Kaior, or smaller Pigmy Antelope, is still less. A young female, which appeared to belong to this variety or species, was in Mr. Bullock's Museum; the size of the body scarcely exceeded that of a Norway rat; the head was round, with a short nose, no distinct muzzle; the eyes much nearer the mouth than in the preceding; the ears round, and the general colour a reddish orange, with a silky gloss, darkest and most vivid on the forehead and back; the throat, breast, and belly, white; nose, legs, and groin, buff; the ears, with a dark border, were translucent, white on the inside, and darkish on the back; there was a small dark spot at the anterior corner of the eye; two teats were observable, no spurious hoofs, and the tail was about three-quarters of an inch long, and rufous. It stood under a bell glass, and could not be more than eight inches high at the shoulder, the legs not exceeding the thickness of a large goose quill.

The Gueveis are brought from Guinea, but too delicate to survive a sea voyage; they are said to be prodigiously active in proportion to their size. Of the Guevei we have compared two specimens, male and female. The figure in the frontispiece of Shaw's *Zoology*, taken from the Leverian specimen, is the best published; the others seem to be of the Guevei Kaior, of which we have seen several skins, all of females, and similar to that described. It is not rare in Ashantee.

Salt's Antelope. (A. Madoka.) Mr. Salt brought from Abyssinia the spoils of a small species allied to the above, and M. de Blainville noticed them under the name of *A. Saltiana*, from the fragment preserved in the Royal College of Surgeons. The head, deprived of the anterior part of the face, shews the horns with six or seven semi-annuli, the points slightly turned forwards; they are one inch and

three quarters long; the ears broad and oval; the eyes without lachrymary sinus, and probably without a pouch below; the hair on the head is very fine, short, and close, of a pale buff colour; but the dimensions of the legs, as given by M. de Blainville (for they no longer exist), make it doubtful whether they belonged to the same animal: they have very long pointed hoofs. It is known by the name of Madoka, in its native regions.

The Tragelaphine Group.

We preserve this group, with one exception, such as it was originally instituted by M. de Blainville. The species are few, uniting considerable elegance of form, with singularly-opposed colours; but their horns depart considerably from the true Antilopine type, having ridges, which give them an angular and compressed character, in some slightly twisted, spiral, or lyrated. They have a small muzzle, no suborbital opening, and the females, provided with four mammæ, are destitute of horns? This group resides chiefly in the deepest glens of woody mountains, living in solitude or in pairs, feeding in the night, and springing with great elasticity; they are timid and vigilant, and seem not to extend beyond Nigritia, and South Africa.

The *Boschbock. (A. Sylvatica.)* The Boschbock is one of those animals which unite elegance and vigour with a singular distribution of lively colours. The fine specimen in Mr. Burchell's collection, measured about five feet three inches in length, two feet seven inches and a quarter at the shoulder, and two feet nine inches at the croup; but there are specimens of larger dimensions. The head is seven inches, and the horns ten inches in length; the ears and tail each six inches; the horns are marked with an obsolete ridge in front, and another very distinct in the rear; they are placed high on the head, parallel with the face, and in their ascent are both spiral and lyrate, black, closely annulated, even

across the anterior ridge, to near the tips, which turn outwards and forwards ; the ears are narrow, but not pointed; the neck is rather short; the head, neck, back of the ears, body, shoulders, and thighs, are of a brilliant chestnut colour; the inside of the ears, part of the under jaw, three spots along the cheek, one larger upon the throat, one on the shoulder, a narrow line along the spine, six spots near it, whereof three before and three behind the hips, five near the groin, and six low down near the anterior part of the thigh, are pure white, as also two lengthened spots on the anterior part of the upper arm, the belly, inside of the thighs, and the legs from the joints downwards. A white line on the back passes down the tail, which is dark at the sides; the chaffron and lips are darker than the rest of the head; the muzzle consists of a naked spot between the nostrils white or flesh-colour; the hoofs are small and black. In the disposition of the smaller white spots there is some variation, but the larger are fixed.

There is a specimen in the Museum of Edinburgh, the horns of which are slender, about six inches and a half long, not spiral, but with a ridge in the front, and five or six annuli at base, the superior half smooth and wavy; the colour of the fur is pale rufous, and the white spots less distinct and regular. This individual as been regarded as a female, but if the female be hornless, it can be only a young male; unfortunately a partial mutilation renders the question doubtful. If the females be without horns, as asserted, they must also be much more difficult to obtain, for among the immense number of materials collected by us on this genus, not one occurs.

Sparrman and Alaman first described the Boschbock; but the only good figure yet published is that in Mr. Daniell's *Sketches of African Scenery*. It is considered as affording good venison, the breast in particular being much prized. At present the species is chiefly, if not exclusively, found

in the Colony of the Cape of Good Hope, east of Camtoos River. It is monogamous, living concealed in deep forests, most active in the night, when its voice, consisting in a kind of barking, sometimes deceives travellers, inducing them to fancy that they are near human habitations, when, in fact, the voice of the Boschbock is a sure indication that they are far from the haunts of man. From some cause, not satisfactorily explained, the males are often found with the throat bare, as if worn off by running through under-wood; but that supposition does not agree with the invariable law of nature, which provides completely for the necessary circumstances of the assigned locality of its creatures; it is more probably the effect of disease, or of the attack of insects.

The *Harnessed Antelope. (A. Scripta.)* Mr. Adanson first noticed the Guib, or Harnessed Antelope, and Buffon both figured and described the male. It is an animal of considerable beauty, more slenderly formed than *Sylvatica*, about the size of a fallow-deer; four feet eight inches long, two feet seven inches and a half at the shoulder, and two feet eight inches and a half at the croup; the ears are five inches long, and the tail six inches; the horns of the male are black, about seven inches long, recumbent, or on the same plane with the face, placed high, straight, with a slight wave, rather stout at base, with two ridges twisting spirally one and a half turn round their axis; the eyes are without lachrymary opening, but the anterior lids are prolonged, and the muzzle is a mere naked space between the nostrils; the colour of the head, back of the ears, neck, back, flanks, belly, croup, and exterior side of the limbs, is a bright fulvous-bay; the nose, mouth, under jaw, throat, breast, a long streak upon the anterior part of the upper arm, the anterior side of the thigh, and a little about the hoofs, are white; two narrow white lines pass on each side from the withers downwards, in an oblique direction, one

to the flank, and the other towards the groin, both are intersected at right angles by two or three similar narrow lines across the centre of the back, followed by four or five others, but shorter across the croup; on the thigh are nine or ten small white spots; two others are near the cubitus of the fore-legs, and one or two on the cheek beneath the eyes, and the extreme edge of the buttocks, is white; on the belly the rufous is duller, and in the female that part, the throat and breast are wholly white. This sex also wants the darker tone on the middle of the forehead, on the posterior pasterns, and the streak more or less extended on the shanks of the fore-legs, as usually seen in the males.

Of this species we have compared a male and a female. It is found in the woods and plains of the country of the Jalofs, and on the Senegal. Professor Lichtenstein, and others, consider it as sometimes found in Caffraria; but Mr. Burchell, during his four years' residence in the interior, did not observe it, nor is the assertion of the colonists to be relied on, as their Bontebock is commonly applied to *A. Euchore*, and even to *Pygargus*.

The *Ribbed Antelope. (A. Phalerata.)* We separate from the Guib the present species, which M. Desmarets considered to differ only on account of nonage; but the constant recurrence of the same marks of difference in the specimens we have examined, warrant the opinion of a difference of species. The horns are small, three or four inches long, reclining, conical, not compressed, without ridges or transverse protuberance in front. Although the animal is altogether smaller, the forehead is comparatively broader, the nose shorter, and terminated by a small black muzzle: the fur is less vivid in colour. A black line of hair passes along the spine, edged on each side with white, commencing on the withers, and terminating at the root of the tail; from each of the white lines nine others descend perpendicularly in the form of narrow ribs, without, however, unit-

ing with a second transverse line, which commences on the middle, or at the insertion of the shoulder blade with the humerus, and passes obliquely downwards to the groin. On the thighs are nine or ten white spots; the white lips and chin, two similarly-coloured spots on the lower jaw, and one on each side of the anterior angle of the eye, with a dark blackish spot between them, mark the face; the tail is long, reaching nearly to the houghs, bay above, white beneath, and black at the end; the rufous colour extends over the belly, the posterior part of the arm, and hind-legs, leaving a lengthened white streak from the point of the shoulder towards the knees; from thence the legs are anteriorly dark to the pasterns, and posteriorly white; the anterior part of the thighs and hind-legs to the hoofs are likewise white, with only a dark spot above the pastern; the hoofs are rather high, and appear more enlarged than in the former.

There are, we believe, in the Paris Museum, three specimens of this animal, one male and two females. We have seen a male and female in London, and have possessed the skin of a kid nearly adult, which differed from the former only in the rufous colour being more yellow, the streaks on the back being more distant from the spine, and the four lumbar transverse ribs ending in round spots; besides which there were twenty-one others on the flank and croup, and the lateral streak commenced behind the elbow, with two additional white spots further forward on the shoulder, and two others near the junction of the neck and withers. The length of this skin was not quite three feet six inches, and shewed that the white spots disappear gradually, as the lines become more distinct and extended; but also that the dorsal white lines approach with age towards the spine, rather than descend to the flanks. The London specimens were all, we believe, brought from the expedition up the river Congo; and it is worth observing, that Professor Smith, in the few notes of his hand which have been pre-

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THE CAMBING OOTAN.

A. SUMATRENSIS.

Hamilton Smith Esq.del.

served, notices the sight of herds of a small species of Antelope striped with white; and as he was thoroughly versed in Zoology, he would have recognised them to be the *Scripta*, if he had not considered them as of a different species. Hence, also, it is probable that they differ in manners from the former; and we find that they reside on the barren plains above the great falls of the Zezere, or Congo.

The Næmorhædine Group.

Several of the latter groups shewed a gradual decline of the typical characters of Antelope, both in the horns and limbs, approaching more and more toward the genus *Capra*, and the present appears still more nearly allied to it. The deer-like conformation of their structure is not only replaced by robuster forms, but the head assumes a Caprine shape; the mild dark eye of the true Antelopes gives place to the yellow or light hazel pupil; the skull is solid and heavy, but the horns still retain a round and falcated character, which is intermediate between the Cephalophine racemus, and Capra, and some shew the pouch upon the intermaxillary bone, and the muzzle common to the former; on the other hand, the legs, and the character of the hair, which is coarse, and often shaggy, belong to the latter. They seem to have, invariably, a white mark on the throat: the females are hornless, and have two mammæ? They reside principally in the forests and high mountains of Central Asia, and of the great Indian Archipelago.

The *Cambing Ootan. (A. Sumatrensis.)* Mr. Marsden first described this species in his history of Sumatra, and a specimen was formerly preserved in the British Museum. The Malay name signifies wood-goat; and it would appear that there are varieties, if not different species of this animal, on the neighbouring islands. The body, limbs, and form of the Cambing are compact, measuring about four

feet six inches in length, from the nose to the tail, and two feet four inches in height at the shoulder; the muzzle is broad, black, and moist; the suborbital sinus is considerable, secreting a yellowish viscous humour through a narrow opening, and shewing, on each side upon the intermaxillary bone, a naked and smooth streak of eighteen or twenty lines in length; the horns are six inches long, rather stout at base, nearly reclining with the plane of the nose, recurved one inch distant below, three inches at the tips, furnished with ten or twelve wrinkles and annuli, and the points smooth; the middle incisors of the teeth are very broad, and the lateral not overlapping, but touching and spreading outwards; the head and body is entirely covered with black hair, close upon the sides of the face, longer and rougher on the body; but the neck from behind the horns to the end of the withers is furnished with white hair, still longer and very abundant, forming a kind of mane; from the corners of the mouth the under jaw and gullet are likewise covered with long white hair, mixed with some yellowish; the legs are black, and the tail of the same colour is short, and furnished with longish hairs; the hoofs high and strongly resemble those of a goat; the female is without horns, and has less white about the neck and throat.

A drawing which we copied from an original in the possession of a Dutch gentleman, represented an animal of this genus, probably a variety, said to be from Malacca. In this the face, from the nose to the middle of the forehead, was distinctly marked with a chaffron of long and coarse black hair, the cheeks, neck, and body being bluish ash, and the fur short and shining; on the withers a small tuft, and beneath the under jaw a small spot of white. In other respects resembling the Cambing, but more slender and elegant in form.

The species resides in the mountain forests of Sumatra,

and is represented as singularly active and lively. We have seen the spoils of two males; the head and skulls of both sexes are in the Royal College of Surgeons, and several drawings, among which those transmitted to M. Cuvier by the late M. Duvaucel.

Duvaucel's Antelope. (A. Duvaucelii.) This provisional name is proposed for an animal of this group, the figure of which was sent with the above by M. Duvaucel; but we believe the description never reached M. Cuvier. Judging from the drawing, it may be considered an animal nearly allied to the Cambing Ootan, somewhat higher at the shoulders, equally robust in the limbs, and about the head, but with horns still more recumbent, apparently less annulated and straighter; the lachrymary opening not perceptible; the muzzle smaller; the hair closer and shorter; the tail a little longer; the colours entirely ashy gray-brown, more rufous on the inner face of the limbs and thighs; the lips and chin, lower part of the jaw and gullet, white; a small white mane from the nape to the withers standing erect, or reclined backwards, edged at the base with a black line; the hoofs are longer and more pointed than in the preceding.

M. F. Cuvier permitted us to take a copy of the original drawing in his possession; the *habitat* is unknown to us.

The *Goral. (A. Goral.)* The Goral is in size equal to the Common Goat, being three feet one inch in length, and two feet at the shoulder. The head is conical, rather compressed and tapering suddenly from the eyes to the snout, very wide across the cheeks, and narrowing toward the forehead; the horns are black, four inches and a half long, subulate, approximating at base, gently bending backwards and slightly diverging; they are smooth, excepting at their base, which is marked with five or six rings, occupying about one-third of the whole length; the eyes are rather large, of a dark brown, surrounded with a circle of whitish

hairs, and long, slender, and black eyelashes; the ears large, five inches in length, ovate, erect; hairs within white; the neck proportionably long; body roundish; the back a little arched, having the appearance, without the reality, of being higher at the rump, but shewing the natural position of the animal ever prepared to leap; from the rump to the tail the croup is much sloped; the legs are slender, well formed; the hoofs black; the tail slender, tapering, about four inches long; the general colour is the gray-mouse (almost white about the lower part of the neck and throat), and darker, with the hair longer upon the upper part of the neck and back, inclining to ferruginous about the legs. The female differs but little; has no horns, but in their place appear two prominent tubercles covered with a tuft of dark brown hair.

A pair were presented by the Court of Katmandoo to the resident, the Honourable E. Gardner, and the male lived in the Governor-general's Menagerie at Barrackpore. It is a native of the Himalaya range, and mountains of the Nepaul frontier, and considered by the natives as the most active of the Antelope genus. It is seen in numerous herds, shy and rarely taken, excepting by stratagem. If pursued, they disperse and fly to precipices and places to which no dogs can follow them. General Hardwicke, from whose description this account is extracted, states, in proof of its agility, shewn within a space of about ten feet square, enclosed by stakes eight or nine feet high, that the animal attempted to spring over, and at every leap so nearly effected its purpose, as to appear in imminent danger of being staked. Its flesh is considered as delicate venison. We possess a drawing, probably of the same individual, under the name of the Bouquetin, or Ibex of Nepaul, for which we are indebted to the kindness of M. F. Cuvier, who received it with others before noticed. In the drawing we find the ears marked with the usual striæ, and the chin,

BRANCH OF THE ASIATIC

THE CHAMOIS.

London, Published by G & W. B. Whittaker, Feb. 1st 1825.

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